Genetic correlations among psychiatric and immune-related phenotypes based on genome-wide association data

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Reviewer Comments to Author:
Reviewer: 1

Reviewer Comment 1: "..the datasets used to obtain several of the key findings (ulcerative colitis and Crohn's disease, from Liu et al) is a trans-ethnic, multi-platform expansion of the dataset from the IBD consortium. Correctly, the authors (based on the sample numbers) appear to have removed the Immunochip and non-European samples, to avoid bias in the correlations. However, the remaining GWAS samples form a subset of the samples in a previous publication, Jostins L et al, 2012, and which have been previously analyzed in Bulik-Sullivan B et al, 2015 (and shown to not correlate with the same bipolar and schizophrenia datasets which are reported as significantly correlated here). To their credit, the authors discuss the issue (in relation to the different filtering scheme used in this paper), but nevertheless using a less-stringent filtering approach, to analyze a subset of a previously non-correlating dataset, to arrive at significant correlations, raises serious questions regarding the reliability of those results. At a minimum, it would be required to see either a similarly significant result using the larger dataset from Jostins L et al 2012, and preferably also a demonstration that the Liu et al 2015 dataset produces this significant correlation without extra filtering."

Author Response 1: The reviewer raises an excellent point; our findings appear to be discrepant with other reports, and that deserves a more thorough investigation. We've made major revisions to address this concern. We obtained multiple versions of each data set and processed them in various ways to explore the effects on LD-score regression findings. Specifically, we examined the following data sets:

Bipolar - Sklar et al., 2011, N=16k, 1KGv3_MAF>0.05
Bipolar - Sklar et al., 2011, N=16k, INFO > 0.9
Bipolar - Hou et al., 2016, N= 40k, 1KGv3_MAF>0.05
Bipolar - Hou et al., 2016, N= 40k, All SNPS (No INFO available)
PGC Schizophrenia European = 75k, 1KGv3_MAF>0.05
PGC Schizophrenia European = 75k, INFO > 0.9
Crohn's Disease, Frank, N=24K, 1KGv3_MAF>0.05
Crohn's Disease, Frank, N=24K, 1KGv3_MAF>0.05
Crohn's Disease, Liu, N=21K, 1KGv3_MAF>0.05
Crohn's Disease, Liu, N=21K, INFO > 0.9
[Jostins et al., does not provide full summary data, so is not analyzed in our study]
Ulcerative Colitis, Andersen, N=21K, 1KGv3_MAF>0.05
Ulcerative Colitis, Andersen, N=21K, All SNPS (No INFO available)
Ulcerative Colitis, Liu, N=27K, 1KGv3_MAF>0.05
Ulcerative Colitis, Liu, N=27K, All SNPS (No INFO available)

We compared the correlations among these different versions of the data. The findings are depicted in Supplementary Figures 3 and 4 [embedded below]. We describe these analyses and the pattern of results in the Discussion section of the paper [excerpted below]. We demonstrate that different patterns of pre-filtering alter the results, such that correlations with schizophrenia and bipolar (for Sklar et al.,) generally become less significant when relatively rare variants (below MAF 5%) are included in the analyses. There is evidence from another genetic correlation study, using a similar method, that differences in magnitude and significance (and in rare cases, even the directionality) of the correlation can change when the analyses are stratified by MAF (https://www.ncbi.nlm.nih.gov/pubmed/29220677). For our study, we chose to exclude relatively rare variation. We discuss this as a limitation as follows:

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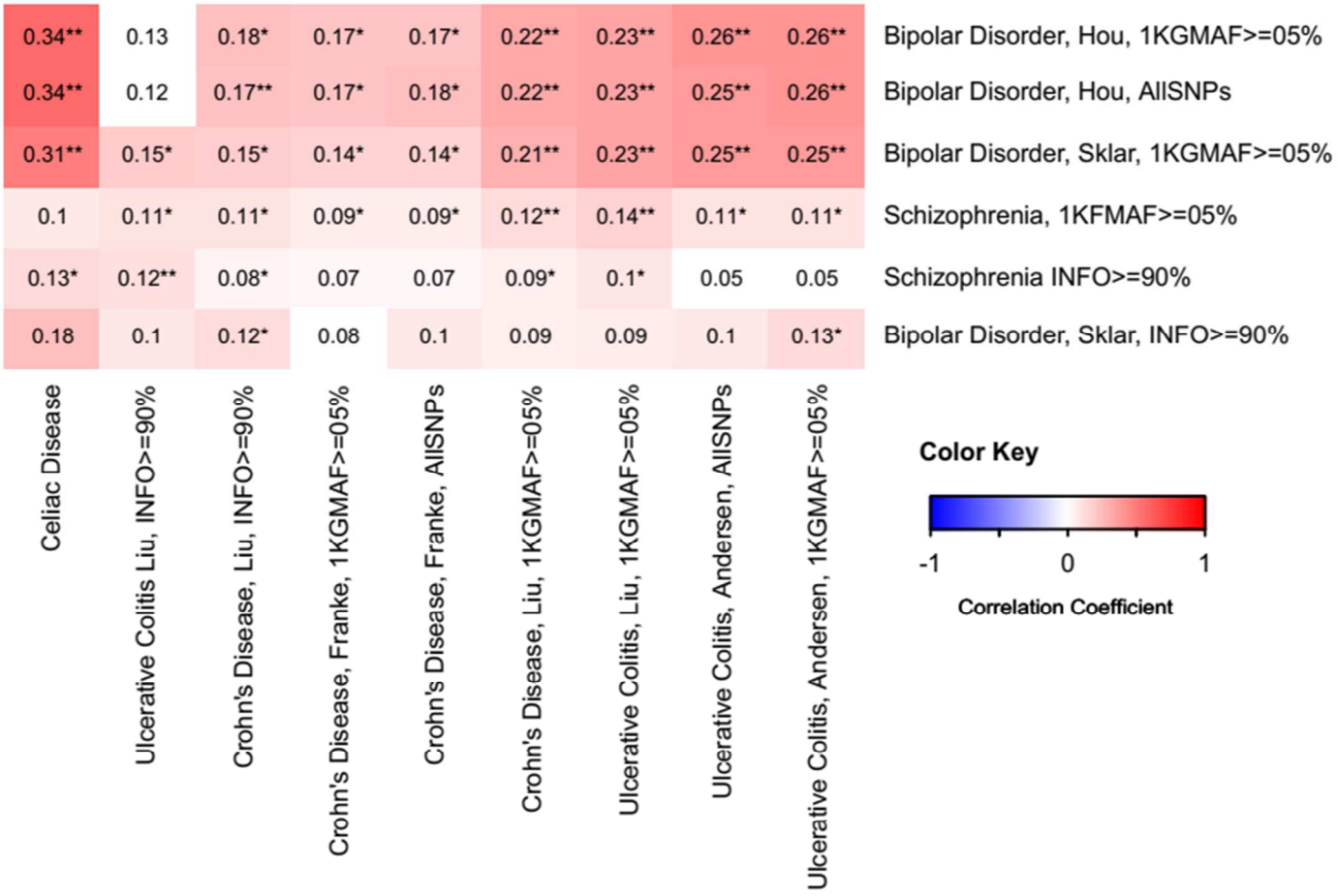
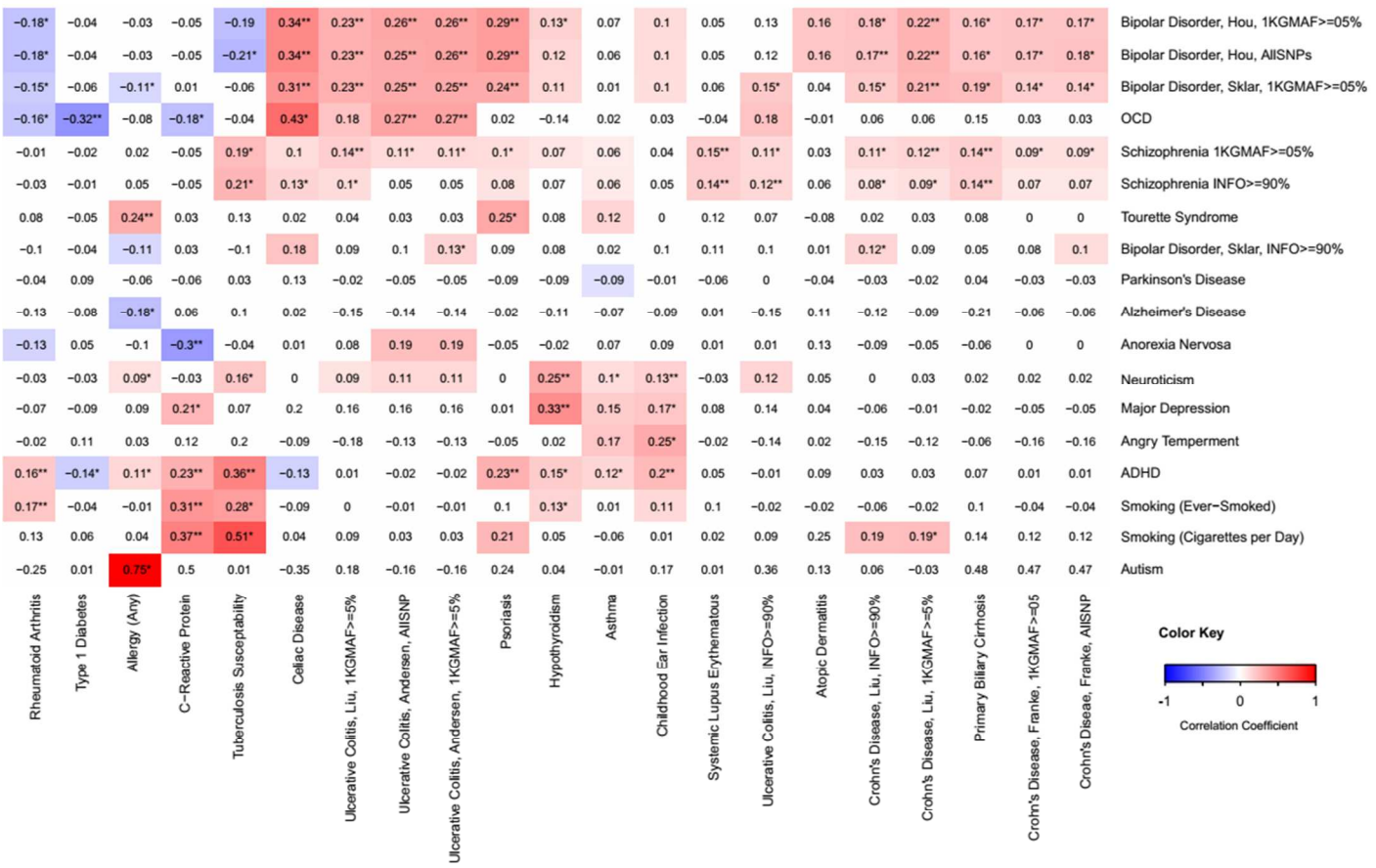
Supplementary Figure 2



Supplementary Figure 1



Response 1 Continued [Excerpt from Discussion]: "The LDSC approach featured here attempts to quantitate similarities and differences in association signals across the entire genome. Some of our phenotype pairs have been examined previously using genome-wide assessment methods, yielding apparently contradictory findings.24,25,71 For example, a previous study implementing a REML-based approach did not find significant SNP-based co-heritabilities between CD and the major psychiatric phenotypes.105 Additionally, the first study implementing the LDSC method found no significant correlation (rg = 0.08 ± 0.08, uncorrected p = 0.33) between BD and UC;22 this study used a smaller data set for BD (Sklar et al., 2011; N = 16,731) and a different version of the UC data set (reported as Jostins et al.,2012; N = 27,432). A similar non-correlation is also reported in LD-Hub (http://ldsc.broadinstitute.org/), using what appears to be the same data sets, although referencing a related article (Liu et al., 2015; N = 27,432). The analyses portrayed in our main text utilized a larger BD data set (Hou et al., N = 40,225), the same data set for UC (Liu et al., 2015; N = 27,432), and uniform criteria for SNP retention based on inclusion in the HapMap3 panel and MAF > 5 % within the 1000 Genomes Project Phase 3 European samples. In order to resolve apparent discrepancies, we obtained additional versions of the available data for BD, SZ, CD, and UC and pre-filtered under both inclusive (imputation INFO score > 0.9 or all SNPs, when INFO score unavailable) or exclusive criteria (MAF > 5 % within the 1000 Genomes Project Phase 3 European samples). We found that correlations between SZ and each of CD, PBC, and UC tended to be more positive and more significant (i.e., reaching a BH-corrected threshold) when using the SZ data filtered at MAF > 5% (Supplementary Figure 3). A similar pattern held true for inclusive vs. exclusive pre-filtering for the BD data set generated by Sklar et al., but this was not the case for the larger Hou et al., data set. A side-by-side comparison of the effects of different pre-filtering decisions for the BD, SZ, CD, and UC data sets in relation to the other phenotypes is provided in Supplementary Figure 4. These observations indicate that decisions pertaining to SNP inclusion can have a considerable effect on the result of the LDSC analysis; this idea is further supported by the observation that stratified genetic correlation analyses based on MAF thresholds can produce different levels of statistical significance and opposite patterns of correlation directionality.[104] Thus, our study suggests that genetic correlations between psychiatric and immune-related disorders may be more significant when analyses are restricted to common variation. Reassuringly, the developers of the HESS method use the same data sets examined presently, and also report positive genetic correlations between SZ and the inflammatory bowel disorders.[23]

Reviewer Comment 2: " Secondly, the issue of sample ethnicity and its match to the reference used in LDSC. The paper states: "In order to facilitate cross-study comparison, we utilized studies that reported samples of European ancestry, broadly defined to include Central, Southern and Eastern Europe, Scandinavia, and Western Russia. One exception to this was the PGC-II schizophrenia summary data, which reflects a meta-analysis of 46 European cohorts and 3 cohorts of East Asian ancestry (Ripke et al., 2014)." However, using a non-matching ancestry (in arguably the best-powered dataset in the study) is know to produce inaccurate results in LDSC, and a European-only version of the data is available from the PGC Schizophrenia group (as used in, for example, Anttila et al 2016). It would be highly recommended to re-run the analysis using the ethnicity-matching version and report that instead, in particular because the datasets reported to have correlations to (PBC, SLE and celiac disease) are fairly small, and thus more easily to produce errant results from error sources such as this."

"… the criteria for phenotype inclusion (the "logical test" in Supplementary Table 1) is overly lenient. I would encourage the authors to use either the same criteria for inclusion used by Bulik-Sullivan B et al, 2015 and Anttila et al, 2016 (heritability z-score>3) or the one employed by LDHub (heritability z-score>4)."

Author Response 2: We have revised the paper to use the European-Only version of PGC Schizophrenia data. Additionally, we obtained better powered data for bipolar disorder, autism, and ADHD. We removed phenotypes with either $N < 5000$ or heritability $z < 3$. This has made the paper stronger and more focused.

Reviewer Comment 3: "Third, as a more minor issue, there are phenotypes (e.g. the tobacco phenotypes) which have already been covered in previous publications (Bulik-Sullivan B et al, 2015 and Anttila et al, 2016), and their results never appear to be dealt with within this publication. It would be better to either focus on all of the phenotypes, or remove those which are not of primary interest."

Author Response 3: We agree with the author's sentiment and have revised to address this. We've generally consolidated the scope of the paper to focus on phenotypes central to our hypotheses. As part of this, we removed the Cigarettes per Day phenotype. We ultimately decided to retain the Ever-Smoked phenotype, which shows positive correlations with C-reactive protein (not previously reported) and rheumatoid arthritis, because they reflect a type of positive control (a correlation with strong epidemiological support) and are illustrative of some of the possible difficulties with interpreting genetic correlations. We've discussed this as follows:

"Finally, positive correlations involving cigarette smoking behavior and CRP ($rg = 0.31 + 0.07$, $p = 3.6x10\text{-}5$), as well as rheumatoid arthritis ($rg = 0.17 + 0.05$, $p = 2.3x10\text{-}3$), are perhaps unsurprising given considerable evidence of elevated CRP in persons who smoke,[125] and increased incidence of smoking behavior among individuals diagnosed with rheumatoid arthritis.[126] These findings may indicate a need for more adequate statistical control over smoking behavior in GWAS studies. SNP-based genetic correlations could arise from a wide variety of underlying factors, including the possibility that the relationship between phenotypes is mediated by behavioral or cultural factors, or influenced by a heritable but unexamined underlying trait that confers risk to both phenotypes.[22,25] Other factors that could contribute to genetic correlations include effects mediated by parental genotypes and their influence on parental behaviors that impact the offspring.[127] Additionally, GWAS studies of psychiatric phenotypes typically do not screen affected cases based the presence of other medical conditions (and vice-versa), thus over-representation of a given phenotype in the sample of another phenotype could bias the data toward the detection of a genetic correlation.

Reviewer Comment 4: "I would recommend not reporting results with and without the MHC locus. While it is admittedly important to many of the phenotypes in question, its inclusion violates the basic assumptions of LDSC, as it mostly just inflates the error function (as can be observed in the univariate estimates from the smaller phenotypes, e.g. type 1 diabetes [h2g 0.18, SE 0.03 without MHC, vs. 0.29, SE 0.12 with it]). Using LDSC to arrive at a genome-wide estimate while including MHC is not correct."

Author Response 4: We now perform all analyses with MHC removal and have revised the paper according to the reviewer's recommendation.

Reviewer Comment 5: "Sixth, for practical reasons, I would very much encourage the authors to find a more concise way to represent the last thousand pages or so; listing thousands of shared SNPs at a fairly high p-value threshold requires at least a better format, but more likely a consideration of what the message is and what would be a more effective way of communication that information. Once these technical issues are resolved, and if the reported correlations remain robustly significant, this paper should make for a very interesting publication for Neuropsychiatric Genetics."

Author Response 5: We appreciate the practical feedback. Based on recommendations from both reviewers, we made a substantial revision to the paper, including using a quantitative method to identify the loci potentially mediating the genome-wide genetic correlations. We provide a concise report of loci that are significantly correlated (BH corrected for total # loci $p < 0.05$; Table 3). We report nominally significant local correlations in Supplementary Table 3, within approximately 1000 lines of data.

Reviewer: 2

Comments to Author

Reviewer Comment 1. "The authors performed numerous genetic correlations. However, in their manuscript, they did not investigate, or at discuss, causal relationships among the traits analyzed. They may consider to use methods, such as two-sample Mendelian randomization. If this is not possible, they may consider to include some discussion about this topic."

Author Response 1: The reviewer makes an excellent point, which we've addressed in several ways in the revised manuscript. While we ultimately did not utilize Mendelian Randomization-based methods, we instead chose to use the new Heritability Estimate from Summary Statistics (HESS) method, which could help shed light on the causal directionality question while also addressing the author's concerns in Comment 2. The HESS method estimates local genetic correlations within LD-based blocks, and then uses the genome-wide hits for each disorder as "instruments" to make an inference about the direction of causality. We report and discuss these findings as follows:

[Results] "The results of the HESS analysis of putative causal directionality (Table 5), indicated that local genetic correlations were stronger in the loci containing GW hits for SZ ($rg \approx 0.46 \pm 0.12$) as compared with those containing hits for the paired autoimmune diseases ($rg \approx 0.18 \pm 0.12$)."

[Discussion] "The results of the HESS analysis of putative causal directionality indicate that the local genetic correlations are higher in loci occupied by SZ GW hits, as compared to the loci harboring hits for the paired autoimmune disorders.[23] This pattern is consistent with the hypothesis that genetic liability toward SZ tends to impart a greater genetic risk for the corresponding paired disorder, rather than the opposite directional hypothesis. A related interpretation may be there is an unobserved intermediate phenotype (*e.g.,* a shared biological pathways/mechanism) that is pleiotropic for both measured phenotypes, but more strongly influences the SZ phenotype. This pattern of findings could also be caused by the presence of a confounding factor (*e.g.,* smoking, socioeconomic status) that portends risk for both phenotypes.[23] Thus, we caution against over-interpretation of these findings. Extensions of Mendelian randomization methods to incorporate two GWAS samples using multi-allelic risk stratifying instruments will be better suited to address these hypotheses,[106] especially as future GWASs provide well-powered genetic estimates of potentially relevant intermediate phenotypes (*e.g.,* brain structure morphometry, circulating immune cell phenotypes, and serum cytokine levels).[107–109] Other limitations of the HESS method, including assumptions related to sample overlap and ancestry stratification, are discussed extensively by the method's developers.[23]"

Table 5. HESS Analysis of Putative Causal Directionality

Phenotype 1, Phenotype 2	Local Genetic Correlation ± Error at Loci Reaching GWS Only for Phenotype 1	Local Genetic Correlation ± Error at Loci Reaching GWS Only for Phenotype 2	Suggested Direction
SZ-CD	0.37 ± 0.09	0.11 ± 0.08	SZ ➔ CD
SZ-PBCs	0.58 ± 0.18	0.26 ± 0.17	SZ ➔ PBC
SZ-SLE	0.26 ± 0.13	0.16 ± 0.16	SZ ➔ SLE
SZ-UC	0.43 ± 0.09	0.16 ± 0.10	SZ ➔ UC

Reviewer Comment 2: "The authors conducted an analysis to characterize psychiatric-immunologic pleiotropic Tag SNPs. Did the authors conduct a permutation analysis to verify that the overlaps observed are not random findings? Which are the criteria for selecting p-value = 0.005 as the association threshold? The authors may replace this analysis with one of the more sophisticated methods currently available"

Author Response 2: We agree with the reviewer's concerns and have attempted to use more empirical and quantitative methods. Specifically, for reasons discussed above, we chose to use the HESS method to identify LD-based blocks of the genome that are significantly correlated between the phenotype pairs, and that may comprise the LDSC-based finding. We focus our reporting on results that are robustly significant after correction for the total number of interrogated loci (BH $p < 0.05$). The findings are summarized in Table 3 (shown below). We find that most of the phenotypes used in the present study were likely under-powered for local genetic correlation analysis, but robustly significant findings were obtained for SZ and several autoimmune disorders. We prioritize reporting loci that co-localize with previously reported genome-wide hits and associated candidate genes.

Table 3. Significant Local Genetic Correlations Based on HESS Analysis

Phenotype Pair	# of Correlated Loci (BH $p < .05$ / $p < .05$) with GWS Hits and Associated Genes Contained within Correlated Loci (BH $p < 0.05$)
ADHD-CRP	0 / 7
ADHD-CEA	0 / 3
ADHD-Psoriasis	0 / 5
ADHD-RA	0 / 5
ADHD-Tuberculosis Susceptability	0 / 0
Anorexia Nervosa-CRP	0 / 0
BD-Celiac Disease	0 / 30
BD -CD	0 / 12
BD -Psoriasis	0 / 3
BD -UC	0 / 5
Cigarettes (Ever-Smoked)-CRP	0 / 0
Cigarettes (Ever-Smoked)-RA	0 / 0
Major Depression-HPT	0 / 0
Neuroticism-CEA	0 / 14
Neuroticism-HPT	0 / 15
OCD-Type 1 Diabetes	0 / 1

SZ-CD	**32** / 251 SZ 4:102921704-103198082** (*ACTR3BD4, BDH2, CENPE, **SLC39A8**, SLC9B1, SLC9B2*) CD 4:103188709-103198082** (*CENPE)* CD 8:126529074-126568355 (*FAM84B*) CD 10:64301873-64588424 (No Genes) CD 12:40337163-40815560 (*CNTN1, **LRRK2**, MUC19, RNU6-713P*); CD 21:16790941-16841303 (No Genes)
SZ-PBC	**37** / 256 SZ 1:30427639-30437268 (No Genes) SZ 10:18725659-18816236 (*AIFM1P1, **CACNB2***) PBC 3:16955259-16955259** (***PLCL2***) PBC 11:118579747-118743772** (*ARCN1, **CXCR5, DDX6**, MIR6716, PHLDB1, RNU6-1157P, RNU6-376P, **TREH**, TREHP*) PBC 22:39670851-39747780 (***CACNA1I,** ENTHD1*)
SZ-SLE	**20** / 200 SZ 1:149999764-150507233 (*ANP32E, **APH1A**, C1orf54, CA14, CIART, MIR6878, MRPS21, OTUD7B, PLEKHO1, PRPF3, RN7SL480P, RNU2-17P, RPRD2, TARS2, VPS45*) SZ 2:58377014-58383820 (*FANCL, VRK2*) SLE 1:161444369-161501904 ** (***FCGR2A***) SLE 7:128562446-128771234 (*CALU, CICP14, FAM71F1, FAM71F2, IMP3P2, RN7SL81P, RNA5SP242, RNA5SP243, RNU6-177P*) SLE 8:11332026-11394233 (*FAM167A-AS1, RN7SL293P, RNU6-1084P, SLC35G5, TDH*) SLE 22:21910280-21999229** (***MAPK1**, PPM1F, PRAMENP, TOP3B, **UBE2L3***)
SZ-UC	**8** / 205 UC 11:63804569-65898631** (*CCDC88B, RPS6KA4, TRPT1, FLRT1*)
Tourette's Syndrome-Allergy	0 / 0

[Discussion] While it is tempting to speculate about these observations, we must acknowledge limitations and caveats of the present approach. Current methods for assessing genetic correlations are not well-suited for fine mapping shared liability across disorders; other methods are better suited for this task. [21,101–103] With respect to local genetic correlations, we have prioritized reporting of loci that co-localize with GW hits. However, this implies that the presence of the GW hit is contributing to the observed correlation, which we have not demonstrated presently. As such, our discussion of potentially pleiotropic loci and candidate genes should be considered anecdotal at this time. One indirect approach to assessing the role of GW hits in a local genetic correlation might be to re-estimate the local correlation after the removal of the smaller region of GW signal from the original data sets. When we conducted this analysis for the SZ-CD pair, we found that the number of significant loci (BH $p < 0.05$) was reduced from 32 to 8, suggesting that GW hits likely play an important role in many of the local genetic correlations. Future studies will be able to combine larger GWAS sample sizes with new methods aimed at stratifying genetic correlations by biological annotations (*e.g.,* tissue type or signaling pathways) in order to more precisely define the parts of the genome that mediate a genetic correlation.[104]

Reviewer Comment 3: It would be nice if the authors can conduct enrichment analyses for gene ontologies and molecular pathways shared among the traits investigated.

Author Response 3: We agree with the reviewer's sentiment. In order to extend upon our local genetic correlation analysis, we investigated methods to quantitatively assess enrichment within the loci that mediate a genome-wide genetic correlation. Regrettably, at the present time, there are no available methods to directly address this question. It is a considerable challenge to perform analyses that are statistically rigorous (correcting for LD-structures in the genome, applying appropriate multiple test correction thresholds) and still powerful enough to detect an effect with the current GWAS sizes. Currently available methods for partitioning genome-wide heritability or correlations through some annotation set are limited to very low resolution features (*e.g.*, basic tissue type, intragenic *vs.* promotors). The use of more refined pathway-level categories poses a problem of inadequate statistical power. The moderators of the LDSC user form assure us that this is an area of active development, but that no agreed upon methods are available. Indeed, we found one method under development that proposes to use fine-grained biological annotations, but the software is currently under revision and is not available for download. (https://www.biorxiv.org/content/early/2017/03/07/114561) . As such, we opted to refrain from performing an annotation-based analysis that might result in false positive findings. We restrict

our reporting to LD-based loci that show significant genetic correlations. We discuss these considerations above.

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Abstract

Individuals with psychiatric disorders have elevated rates of autoimmune comorbidity and altered immune signaling. It is unclear whether these altered immunological states have a shared genetic basis with those psychiatric disorders. The present study sought to use existing summary-level data from previous genome-wide association studies (GWASs) to determine if commonly varying single nucleotide polymorphisms (SNPs) are shared between psychiatric and immune-related phenotypes. We estimated heritability and examined pair-wise genetic correlations using the linkage disequilibrium score regression (LDSC) and heritability estimation from summary statistics (HESS) methods. Using LDSC, we observed significant genetic correlations between immune-related disorders and several psychiatric disorders, including anorexia nervosa, attention deficit-hyperactivity disorder, bipolar disorder, major depression, obsessive compulsive disorder, schizophrenia, smoking behavior, and Tourette syndrome. Loci significantly mediating genetic correlations were identified for schizophrenia when analytically paired with Crohn's disease, primary biliary cirrhosis, systemic lupus erythematosus, and ulcerative colitis. We report significantly correlated loci and highlight those containing genome-wide associations and candidate genes for respective disorders. We also used the LDSC method to characterize genetic correlations amongst the immune-related phenotypes. We discuss our findings in the context of relevant genetic and epidemiological literature, as well as the limitations and caveats of the study.

Keywords: allergy, anorexia nervosa, attention deficit-hyperactivity disorder, autoimmune disorder, bipolar disorder, celiac disease, childhood ear infection, C-reactive protein, Crohn's disease, genetic correlation, genome-wide association, hypothyroidism, major depression, neuroticism, obsessive schizophrenia, primary biliary cirrhosis, rheumatoid arthritis, smoking, systemic lupus erythematosus, Tourette syndrome, tuberculosis susceptibility, type 1 diabetes, ulcerative colitis.

Introduction

The biological bases of major psychiatric disorders have been studied for decades, yet they remain largely unresolved. Evidence from both clinical and biomedical literature has demonstrated that individuals with these conditions show differences in circulating immunologic markers, functional capacities of isolated immune cells, and atypical prevalence of clinical immune-related phenotypes compared to individuals not affected by psychiatric or neurodevelopmental disorders.[1–10] It remains unclear what roles (if any) altered immunologic functions may play in the major psychiatric phenotypes, though plausible mechanisms linking altered immune functions with neurobiological changes during early brain development and in fully developed adults have been identified.[11–18] While some studies have already suggested potential genetic bases for the immune dysregulation observed in a subset of psychiatric patients,[19–22] the extent to which co-occurrence or segregation of clinical phenotypes may be influenced by similarities in genome-wide genetic risk signals warrants further examination. Genome-wide association studies (GWASs) and meta-analyses can shed light on the regions of the genome that tend to associate with a clinical phenotype, quantitative trait, or biomarker; this is accomplished through tagging and association-testing of single nucleotide polymorphisms (SNPs) that vary within the population. Recently developed methods like linkage disequilibrium (LD) score regression (LDSC)[23] and Heritability Estimation from Summary Statistics (HESS)[24] allow for direct comparison of GWAS summary statistics for two different phenotypes for quantitative assessment of genetic correlation.

In the present study, we leveraged existing data to explore the genetic associations of a set of medical phenotypes that are enriched with immune and inflammatory processes; these included allergic conditions, classic autoimmune diseases, other inflammatory diseases, and vulnerability to infectious disease. We sought to cross-correlate the genetic associations of these phenotypes with the associations obtained from studies of a set of psychiatric and behavioral phenotypes. We hypothesized that some phenotype-pairs with evidence for increased clinical comorbidity might also share similarities in their genome-wide association profile, which would be reflected in our analyses as significant positive correlations. Additionally, in light of literature suggesting shared genetic risk among some immune and

inflammatory disorders, we assessed genetic correlations within this set of phenotypes using the LDSC method; these findings are reported within the Supplementary Materials. Genetic correlations within the set of psychiatric phenotypes have been reported previously[23,25,26] and are not examined in the present study.

Materials and Methods

Literature Search

We searched the published literature (Pubmed, SCOPUS), data repositories (dbGaP and immunobase.org), and the downloads page of the Psychiatric Genomics Consortium (PGC) website (https://www.med.unc.edu/pgc/downloads) to identify phenotypes with potentially usable GWAS and GWAS meta-analysis summary statistics. For studies identified in the published literature, we contacted corresponding authors to request summary statistics. In order to facilitate cross-study comparison, we utilized studies that reported samples of European ancestry, broadly defined to include Central, Southern and Eastern Europe, Scandinavia, and Western Russia. Our initial search yielded a large number of datasets reflecting a wide-range of behavioral and immune-related phenotypes (Supplementary Table 1); the set of phenotypes ultimately retained for final analyses was selected based on criteria described below. When multiple studies were identified for a given phenotype, we pursued the studies with the largest effective sample sizes and ultimately used the available study with the largest heritability z-score. In several instances, data from the largest existing studies could not be shared or reflected a mixed-ancestry meta-analysis; in these cases, we deferred to the next largest European-ancestry study. We chose to retain datasets with an effective sample size greater than 5000 individuals and with estimated SNP heritability z-score ≥ 3, in keeping with previous recommendations.[23] This filter resulted in the exclusion of many relevant immune-related phenotypes, including eosinophilic esophagitis,[27] granulomatosis with polyangiitis,[28] IgA nephropathy,[29] HIV-related neurocognitive phenotypes,[30] morning cortisol levels,[31] myeloid leukemias,[32] psoriatic arthritis,[33] sarcoidosis,[34] and systemic sclerosis.[35] This also resulted in exclusion of several psychiatric and behavior phenotypes, including adolescent alcohol abuse,[36] anxiety-spectrum disorders,[37] borderline personality disorder,[38] language impairment,[39] personality domains (five

factor model),[40] post-traumatic stress disorder,[41] and reading disability.[42] We also ultimately excluded data from studies of ethanol, opiate, and cocaine dependence,[43–45] as genetic correlations involving these phenotypes were frequently outside the boundaries tolerated by the LDSC software, making them difficult to interpret; this may have been related to the ordinal-ranked phenotypes used in the GWASs. Finally, while relationships between tobacco-smoking behavior and other psychiatric phenotypes have been examined previously,[23,25] we chose to retain smoking data in order to assess relationships with a more complete set of immune-related phenotypes. The full list of phenotypes identified in the search and retained for analyses is shown in Supplementary Table 1, along with identification of the study cohorts and consortia that generated these data, full citations of the respective publications, and indications of sample size, information regarding genomic inflation, and estimated SNP heritability.

GWAS Phenotypes Retained for Genetic Correlation

For our psychiatric and behavior-related phenotypes, we ultimately retained GWAS summary data reflecting studies of Alzheimer's disease, [46] angry temperament [47], anorexia nervosa,[48] attention deficit-hyperactivity disorder (ADHD),[49] autism,[50] bipolar disorder (BD),[51,52] cigarette smoking (ever-smoked status),[53] major depressive disorder,[54] trait neuroticism,[55] obsessive-compulsive disorder (OCD),[56] Parkinson's disease,[57] schizophrenia (SZ),[58] and Tourette Syndrome (personal communication from PGC Working Group). Collectively, these phenotypes were treated as a set. For phenotypes that are known or suspected to involve alterations to immune cells and/or inflammatory signaling, we ultimately retained GWAS data reflecting allergy (any, self-reported),[57,59] asthma (self-reported),[57] atopic dermatitis,[60] childhood ear infection (self-reported),[57] celiac disease,[61] serum C-reactive protein (CRP),[62] Crohn's disease (CD),[63,64] hypothyroidism (self-reported),[57] primary biliary cirrhosis (PBC),[65] psoriasis,[66] rheumatoid arthritis,[67] systemic lupus erythematosus (SLE),[68] susceptibility to pulmonary tuberculosis,[69] type 1 diabetes,[70] and ulcerative colitis (UC).[71] These phenotypes were treated as a set in subsequent analyses.

Data Pre-Processing and Analysis

Our primary analyses were performed using the LDSC software (https://github.com/bulik/ldsc).[23] Briefly, this set of tools can be used with existing GWAS summary data in order to distinguish polygenicity from confounding caused by uncontrolled population stratification or cryptic relatedness among samples,[72] to estimate the heritability of a given phenotype,[23] and to estimate the genetic correlation between two phenotypes based on two separate or related sets of summary statistics.[23] In the latter application, the minimal requirements for each set of summary statistics include columns of data indicating SNP ID, the identities of reference and non-reference alleles, association *p*-value, effect size, test statistic (*e.g.,* odds ratio, regression β, or Z-score), and sample size (per SNP or for all SNPs). For each pair of phenotypes, this tool compares the strength and direction of association signal at each locus while correcting for the correlation that would be expected based on genetic linkage alone, and it provides an estimate of the genetic correlation between phenotypes. This method relies on adjustment for the linkage between SNPs (*i.e.,* covariance caused by genomic proximity); for our analyses, we used the set of LD scores provided by the software's creators, based on the 1000 Genomes Project's European sample (file = eur_w_ld_chr, URL = https://data.broadinstitute.org/alkesgroup/LDSCORE). Because minor allele frequencies (MAFs) and imputation quality scores were not available for all the obtained sets of GWAS results, we filtered the GWAS results to retain only SNPs that were included within the HapMap3 panel and had a MAF $\geq$ 5 % within the 1000 Genomes Project Phase 3 European samples;[23] this decision resulted in the exclusion of a sizable proportion of SNPs, but ensured equitable treatment of all datasets. The extended major histocompatibility complex (MHC) region contains high amounts of long-range LD, making it challenging to accurately map association signals in this region. For this reason, and following the work of others,[23,25] we excluded this region from our analyses (chromosome 6, base positions $25x10^6$ to $35x10^6$). Additional SNP quality control (QC) routines followed those implemented by the GWAS authors and the defaults employed with the LDSC *munge_sumstats.py* function; this function checks alleles to ensure that the supplied alleles match those in the HapMap3 reference panel. For each dataset, we estimated the phenotype's heritability. The results of this analysis, along with features of each GWAS dataset (sample size, number of QC-positive SNPs, genomic inflation factor, *etc.*), are shown for all

phenotypes in Supplementary Table 1. All phenotypes with sample size ≥ 5000 and estimated SNP heritability z-score ≥ 3 were retained for correlation analysis (indicated in Supplementary Table 1 in green highlight). Pair-wise genetic correlations were assessed between retained phenotypes based on the intersection of QC-positive SNPs, and heatmaps were constructed to depict these relationships. For correlation coefficients returned within the bounds of the LDSC software, *p*-values were corrected using the Benjamini-Hochberg (BH) method for the total number of unique tests depicted in each correlation matrix. Within the main text, we describe only correlations that survived family-wise multiple-test correction. Correlations are reported as the coefficient ± standard error. For phenotype-pairs showing statistically significant genetic correlations, we re-evaluated the genetic correlations and estimated heritability using the HESS method (https://github.com/huwenboshi/hess).[24]

Characterization of Genetically Correlated Loci and Associated Genes

For psychiatric-immune phenotype-pairs showing significant genetic correlations after BH correction for multiple testing, we used the HESS software to estimate partitioned heritability and genetic correlations based on smaller LD-based segments of the genome (average size = 1.5 Mb). We report the number and identity of genomic partitions (based on HG19 reference) displaying significant local genetic correlations and apply correction for the total number of partitions (≈1694, after MHC removal). Because presently available methods are poorly suited for fine-mapping the loci mediating a genetic correlation, we prioritized reporting correlated loci that also contain genome-wide significant associations for the relevant phenotypes (*i.e.*, associations with $p < 5x10^{-8}$; subsequently called GW hits). We report GW hits contained within the present datasets, but also cross-reference these findings with those contained in immunobase.org, in order to identify loci associated with multiple immune-related disorders. We report the HGNC symbols for candidate genes proposed to mediate those associations. The full list of genes contained within each correlated loci is provided in Supplementary Table 3. Additionally, we used HESS to examine patterns of local genetic correlation in relationship to GWAS hits to make inferences about putative causal directionality between the phenotype-pairs. For all HESS analyses, we used the 1000 Genomes Project Phase 3 European reference panel and the LD-independent genome partitions

recommended by the software developers.[73] Following the developers' practices, we assumed no sample overlap for comparisons of data generated by different consortia.[24]

Results

Genome-Wide Correlations between Psychiatric and Immune-Inflammatory Phenotypes

All pair-wise LDSC genetic correlations between psychiatric and immune-related phenotypes are depicted in Figure 1. Notably, twenty-one correlations survived BH correction for multiple testing (denoted with **) and 6 survived a more stringent Bonferroni correction (denoted with ***). Full results for these analyses are provided in Supplementary Table 2. Significant positive relationships were observed between ADHD and each of: CRP ($rg = 0.23 \pm 0.06$, $p = 2.0\text{x}10^{-4}$), childhood ear infections ($rg = 0.20 \pm 0.05$, $p = 2.0\text{x}10^{-4}$), psoriasis ($rg = 0.23 \pm 0.07$, $p = 1.0\text{x}10^{-3}$), rheumatoid arthritis ($rg = 0.16 \pm 0.05$, $p = 9.0\text{x}10^{-4}$), and tuberculosis susceptibility ($rg = 0.36 \pm 0.11$, $p = 1.6\text{x}10^{-3}$). Anorexia nervosa showed a negative genetic correlation with CRP ($rg = -0.30 \pm 0.08$, $p = 1.0\text{x}10^{-4}$). BD was positively correlated with each of: celiac disease ($rg = 0.31 \pm 0.09$, $p = 4.0\text{x}10^{-4}$), CD ($rg = 0.21 \pm 0.05$, $p = 3.7\text{x}10^{-5}$), psoriasis ($rg = 0.25 \pm 0.08$, $p = 3.8\text{x}10^{-3}$), and UC ($rg = 0.23 \pm 0.06$, $p = 2.0\text{x}10^{-4}$). Major depressive disorder was positively correlated with hypothyroidism (0.33 ± 0.09, $p = 5.0\text{x}10^{-4}$). Similarly, neuroticism was positively correlated with hypothyroidism ($rg = 0.25 \pm 0.06$, $p = 7.2\text{x}10^{-5}$), in addition to childhood ear infection ($rg = 0.13 \pm 0.04$, $p = 8.0\text{x}10^{-4}$). OCD was negatively correlated with type 1 diabetes ($rg = -0.32 \pm 0.11$, $p = 5.4\text{x}10^{-3}$). Smoking behavior was positively correlated with CRP ($rg = 0.31 \pm 0.07$, $p = 3.6\text{x}10^{-5}$) and with rheumatoid arthritis ($rg = 0.17 \pm 0.05$, $p = 2.3\text{x}10^{-3}$). SZ showed positive genetic correlations with CD ($rg = 0.12 \pm 0.03$, $p = 2.0\text{x}10^{-4}$), PBC ($rg = 0.14 \pm 0.05$, $p = 2.0 \text{ x } 10^{-3}$), SLE ($rg = 0.15 \pm 0.04$, $p = 2.0\text{x}10^{-4}$), and UC ($rg = 0.14 \pm 0.04$, $p = 2.0\text{x}10^{-4}$). Finally, we observed a positive genetic correlation between Tourette syndrome and allergy ($rg = 0.24 \pm 0.06$, uncorrected $p = 2.7\text{x}10^{-5}$). Additionally, several large-magnitude correlations attained a nominal threshold of statistical significance (*e.g.,* autism-allergy and OCD-celiac); these correlations tended to have a higher standard error and were generated using relatively smaller GWAS sample sizes. As such, they may be more likely to reflect false positives and should be regarded with appropriate skepticism.

For phenotypes involved in correlations that survived multiple test correction, estimated SNP heritability is shown in Table 2. For these phenotypes, we reassessed SNP heritability and the magnitude of genome-wide genetic correlations using the HESS method (Tables 1 and 2). Correlation coefficients were not correlated between the two methods (pearson $r = 0.25$, $p = 0.25$; Supplementary Figure 1) and the absolute value of the difference was negatively related to sample size ($r = -0.45$, $p = 0.035$; Supplementary Figure 2), which is consistent with the software developer's guidelines.[24] LDSC-based correlations among the immune-related phenotypes are reported in the Supplementary Text and Supplementary Table 5.

Characterization of Loci Contributing to Psychiatric-Immune Genetic Correlations

For psychiatric-immune phenotype-pairs that demonstrated a significant genome-wide correlation with the LDSC method (*i.e.,* those in Table 1), we used the HESS software to examine the genetic correlation within the ~1694 partitioned genomic loci. The number of correlated loci before and after BH multiple test correction are depicted in Table 3; detailed results for these analyses, including local heritability, correlation strength, and the lists of gene symbols within each loci are provided in Supplementary Table 3. Only SZ displayed robust local genetic correlations with immune-related phenotypes, including thirty-two loci with CD, 37 loci with PBC, 20 loci with SLE, and 8 with UC (Table 3, depicted in Figure 2). Upon closer examination of the loci implicated between SZ and CD, we noticed that five of these loci contained GW hits, including one locus on chromosome 4q24 (4:100678360-103221356; highlighted green in Figure 2) that contained GW hits for both SZ and CD within the present data, and with 4 other autoimmune diseases (immunobase.org); these signals are near autoimmunity candidate genes *NFKB1* and *MANBA*, as well as proposed SZ candidate gene *SLC39A8*, among others contained within the locus (see Supplementary Table 3). The locus on 10p12.3 (10:18725659-18816236, highlighted green) contains a GW hit for SZ attributed to calcium channel gene *CACNB2*. Another locus mediating a significantly correlated locus on 12q12 (12:39227169-40816185, highlighted green) contains a GW hit for CD attributed to *LRRK2*. When examining the loci implicated between SZ and PBC, we observed 3 harboring GW hits for the former and 3 harboring signals for the latter, including loci within

3p24.3 (3:16282442-17891118, highlighted orange) containing *PLCL2* and within 11q23.3 (11:117747110-119215476, highlighted orange), containing candidate genes *CXCR5*, *DDX6*, and *TREH*. Among the loci implicated between SZ and SLE, we observed two harboring GW hits for the former and 3 harboring hits for the latter. One such locus within 1q21 (1:148361253-151538881, highlighted yellow) contains a SZ association signal localizing near candidate gene *APH1A*. Another locus within 1q23 (1:159913048-162346721, highlighted yellow) contains a GW hit for SLE, as well as several other autoimmune diseases, associated with candidate gene *FCGR2A*. Similarly, a locus within 22q11.21 (22:19912358-22357325, highlighted yellow) containing multi-disease association signal is associated with *MAPK1* and *UBE2L3*. Among the loci implicated between SZ and UC, one within 11q13.1 (11:63804569-65898631) harbored GW hits for multiple autoimmune disorders.

We also sought to examine whether the specific loci might be implicated across multiple psychiatric-immune disorder pairs (Figure 2). An analysis limited to only those surviving BH correction for multiple testing yielded only two loci shared by multiple disease pairs. The first locus (within 3p24.3; 3:21643707-22204244) was identified in correlations of SZ with PBC and with CD; it contained no GWS hits and two genes of unclear consequence *ZNF385D* and *ZNF385D-AS2*. The second locus within 8p32.1 (8:11278998-13491775, highlighted brown) was identified in correlations of SZ with PBC and with SLE; this locus contained numerous genes and is adjacent to a GWS hit for SLE associated with candidate gene *BLK*. When we broadened the scope to examine all loci implicated in nominally significant correlations (uncorrected $p < 0.05$), we find several that are common to multiple psychiatric-immune disorder pairs (Table 4). The most widely implicated locus was shared among the 5 pairs of psychotic and inflammatory bowel disorders (within 17q12; 17:36809344-38877404, highlighted purple) and contains a GW hit for BD ascribed to candidate gene *ERBB2*. There were another eight loci that were implicated in four disorder pairs. Among these, one located within 1q32.1 (1:200137649-201589975, highlighted purple) contains GW hits for multiple autoimmune disorders (including celiac disorder, CD, multiple sclerosis, and UC) and is near candidate genes *CACNA1S* and *KIF21B*. The full list of loci implicated across multiple disorder pairs is available in Supplementary Table 3. The results of the HESS

analysis of putative causal directionality (Table 5) indicated that local genetic correlations were stronger in the loci containing GW hits for SZ ($rg \approx 0.41 \pm 0.12$) as compared with those containing hits for the paired autoimmune diseases ($rg \approx 0.17 \pm 0.13$).

Discussion

In contrast to previous studies examining large sets of medical, anthropomorphic, metabolic, and behavioral phenotypes,[23–26,74] the present study performed a focused comparison of psychiatric and immune-related phenotypes using two methods to estimate genetic correlation from summary statistics. We used updated versions of psychiatric GWASs[49–51,56] and compiled a more comprehensive set of immune-related phenotypes, while simultaneously reducing the burden imposed by multiple testing. Additionally, this analysis reflects the first application of the LDSC and HESS method for some of these phenotype-pairs. We identified several genome-wide correlations that were robust to multiple testing. Furthermore, we used the HESS method to validate genome-wide correlations and to conduct a quantitative analysis that localizes correlations to regions of the genome. We prioritized the reporting of findings based on co-localization with GW hits. As such, this study provides a quantitative map of genetic relationships between psychiatric and immune-related disorders and serves, along with previous work,[75] as a starting point for identifying and characterizing potentially pleiotropic loci.

Prominent among the LDSC genome-wide significant findings was a cluster of modest positive correlations involving BD (*rg*s ranging 0.25 to 0.33) and SZ (*rg*s ranging 0.12 to 0.15) in conjunction with immune-related disorders involving the gastrointestinal tract (*i.e.,* CD, PBC, UC). These findings are consistent with available epidemiological evidence indicating that the presence of one set of disorders portends increased risk for a diagnosis from the other class of disorders, though the causality and temporality of these relationships is not clearly established.[76–82] Positive genetic inter-correlations among these phenotypes are also consistent with recent work demonstrating that the positive correlation between BD and SZ are significantly mediated by both CNS and immunologic tissues.[83] Our local genetic correlation analyses were inadequately powered to detect loci relevant to most of the psychiatric-immune

disorder pairs, including BD. However, comparisons with SZ yielded 97 loci that were robust to multiple test correction, 18 of which also were shown to harbor GW hits in previous studies. In several instances, these GW hits localize near genes with functions that are pleiotropic and relevant to both brain and immune system phenotypes. For example, we identified a SZ-CD correlated locus at 4q24 (4:100678360-103221356) that contained GW hits for both SZ (putatively attributed to *SLC39A8*) and several autoimmune diseases (putatively attributed to *NFKB1* and *MANBA*); others have proposed that associations at this locus may exert pleiotropic effects on a wide range of phenotypes (additionally including body mass index, serum levels of manganese, N-terminal pro-B-type natriuretic peptide, and HDL-cholesterol) through a functional variant found in European populations affecting the *SLC39A8* cation transporter.[84,85] A locus within 11q23.3 (11:117747110-119215476) was significantly correlated between SZ and PBC and harbors a region of GW hits for multiple autoimmune disorders attributed to *PLCL2*, a catalytically inactive phospholipase-like protein thought to influence intracellular signaling, calcium homeostasis, and GABA-ergic receptor trafficking in immune and neuronal cell types, among others.[86–88] A *de-novo* missense mutation affecting this gene was identified in an exome sequencing study of SZ affected individuals, though no replication appears to have been reported.[89] Similarly, a correlated locus within 22q13.1 (22:39307894-40545797, highlighted yellow in Figure 2) contains GW hits for PBC, which overlaps with voltage gated calcium channel gene *CACNA1I*; this gene has been implicated by both GWAS and rare-variant studies of SZ.[58,90] Another correlated locus within 11q23 (11:118579747-118743772) contained GW hits for multiple autoimmune disorders and is suspected to exert pleiotropic effects through several genes, whose functions include repression of aberrant interferon signaling (*DDX6*),[91] chemokine signaling between T-helper and B-cells (*CXCR5*),[92,93] and enzymatic break down of microbial disaccharides (*TREH).*[94] Notably, functional genomic studies have identified *DDX6* as a gene that is perturbed during neuronal differentiation of samples derived from individuals with schizophrenia,[95] and as a peripheral blood marker of cerebrospinal fluid serotonin metabolite levels,[96] supporting its relevance to psychiatric phenotypes.

We also examined loci that showed a nominal genetic correlation across multiple disorder pairs, and found these loci also harbored GW hits for respective phenotypes. The locus at 17q12 shared among multiple disorders contains a GW hit for BD (17:36809344-38877404) ascribed to candidate gene *ERBB2*.[52] This gene and its relatives encode receptor tyrosine kinases that interact with a family of growth factors called neuregulins to regulate the assembly of neural circuitry, myelination, neurotransmission and synaptic plasticity. A large body of evidence implicates both ligands and receptors from these families as susceptibility genes for SZ and BD.[97] Notably, *ERBB2* overlaps with GW hits for multiple autoimmune disorders, though these have been attributed to different genes in the region. Another locus at 1q32.1 (1:200137649-201589975) contains GW hits for multiple autoimmune disorders (including celiac disease, CD, multiple sclerosis, and UC) and is near candidate genes *C1orf106*, *CACNA1S*, *GPR25*, and *KIF21B*. Genetic disruptions of voltage-gated calcium channels, including *CACNA1S,* are well-established susceptibility factors in psychiatric and neurological disorders.[98,99] *KIF21B* encodes a neuronal motor protein implicated in $GABA_A$ receptor trafficking,[100] in addition to having a suspected role in regulating inflammatory signaling in several lymphocyte subtypes.[101]

While it is tempting to speculate about these observations, we must acknowledge limitations and caveats of the present approach. Current methods for assessing genetic correlations are not well-suited for fine-mapping shared liability across disorders; other methods are better suited for this task, including extensions of GWAS that model multiple phenotypes simultaneously.[22,55,102,103] With respect to local genetic correlations, we have prioritized reporting of loci that co-localize with GW hits. However, this implies that the presence of the GW hit is contributing to the observed correlation, which we have not demonstrated presently. As such, our discussion of potentially pleiotropic loci and candidate genes should be considered anecdotal at this time. One indirect approach to assessing the role of GW hits in a local genetic correlation might be to re-estimate the local correlation after the removal of the smaller region of GW signal from the original datasets. When we conducted this analysis for the SZ-CD pair, we found that the number of significant loci (BH $p < 0.05$) was reduced from 32 to 8, suggesting that GW

hits likely play an important role in many of the local genetic correlations. Future studies will be able to combine larger GWAS sample sizes with new methods aimed at stratifying genetic correlations by biological annotations (*e.g.,* tissue type or signaling pathways) in order to more precisely define the parts of the genome that mediate a genetic correlation.[83]

Several methods have now been used to examine quantitative SNP-based genetic relationships between psychiatric and immune-related phenotypes, including restricted maximum likelihood (REML) co-heritability, polygenic risk scores, genetic analysis incorporating pleiotropy and annotations, and other permutation-based methods.[22,104–106] Different approaches rest on unique assumptions, test different sets of hypotheses, and appear prone to generating sometimes conflicting results. Using several approaches that were not dependent on the directionality of a given SNP's effect, Wang and colleagues concluded that many (24 of 35) pairs of psychiatric and immune-related phenotypes shared a statistically significant proportion of risk-associated loci; among these findings was a significant genetic overlap between BD (as well as SZ) and UC.[22] However, many of the other relationships identified in that study were not significant in the present study. Another recent study demonstrated that polygenic risk scores reflecting additive risk for several autoimmune diseases can explain a small proportion of variance in SZ case-control status, yet the genome-wide significant SNPs from the autoimmune GWASs were not over-represented among SZ's genome-wide significant hits when permutation-based analysis was performed.[105] The apparent disagreement between different approaches for assessing shared genetic liability thus underscores the value of examining the consensus across studies and methods.[105]

The LDSC approach featured here attempts to quantitate similarities and differences in association signals across the entire genome. Some of our phenotype-pairs have been examined previously using genome-wide assessment methods, yielding apparently contradictory findings.[25,26,72] For example, a previous study implementing a REML-based approach did not find significant SNP-based co-heritabilities between CD and the major psychiatric phenotypes.[106] Additionally, the first study implementing the LDSC method found no significant correlation ($rg = 0.08 \pm 0.08$, uncorrected $p = 0.33$)

between BD and UC;[23] this study used a smaller dataset for BD (Sklar *et al*., 2011; *N* = 16,731) and a different version of the UC dataset (reported as Jostins *et al.,*2012; *N* = 27,432). A similar non-correlation is also reported in LD-Hub (http://ldsc.broadinstitute.org/), using what appears to be the same datasets, although referencing a related article (Liu *et al.*, 2015; *N* = 27,432). The analyses portrayed in our main text utilized a larger BD dataset (Hou *et al.*, N = 40,225), the same dataset for UC (Liu *et al.*, 2015; N = 27,432), and uniform criteria for SNP retention based on inclusion in the HapMap3 panel and MAF $\geq$ 5 % within the 1000 Genomes Project Phase 3 European samples. In order to resolve apparent discrepancies, we obtained additional versions of the available data for BD, SZ, CD, and UC and pre-filtered under both inclusive (imputation INFO score $\geq$ 0.9 or all SNPs, when INFO score unavailable) or exclusive criteria (MAF > 5 % within the 1000 Genomes Project Phase 3 European samples). We found that correlations between SZ and each of CD, PBC, and UC tended to be more positive and more significant (*i.e.,* reaching a BH-corrected threshold) when using the SZ data filtered at MAF > 5% (Supplementary Figure 3). A similar pattern held true for inclusive *vs*. exclusive pre-filtering for the BD dataset generated by Sklar *et al.*, but this was not the case for the larger Hou *et al.*, dataset. A side-by-side comparison of the effects of different pre-filtering decisions for the BD, SZ, CD, and UC datasets in relation to the other phenotypes is provided in Supplementary Figure 4. These observations indicate that decisions pertaining to SNP inclusion can have a considerable effect on the result of the LDSC analysis; this idea is further supported by the observation that stratified genetic correlation analyses based on MAF thresholds can produce different levels of statistical significance and opposite patterns of correlation directionality.[83] Thus, our study suggests that genetic correlations between psychiatric and immune-related disorders may be more significant when analyses are restricted to common variation. Reassuringly, the developers of the HESS method use the same datasets examined presently, and also report positive genetic correlations between SZ and the inflammatory bowel disorders.[24] The results of the HESS analysis of putative causal directionality indicate that the local genetic correlations are higher in loci occupied by SZ GW hits, as compared to the loci harboring hits for the paired autoimmune disorders.[24] This pattern is consistent with the hypothesis that genetic liability toward SZ tends to impart

a greater genetic risk for the corresponding paired disorder, rather than the opposite directional hypothesis. A related interpretation may be there is an unobserved intermediate phenotype (*e.g.,* a shared biological pathways/mechanism) that is pleiotropic for both measured phenotypes, but more strongly influences the SZ phenotype. This pattern of findings could also be caused by the presence of a confounding factor (*e.g.,* smoking, socioeconomic status) that portends risk for both phenotypes.[24] Thus, we caution against over-interpretation of these findings. Extensions of Mendelian randomization methods to incorporate two GWAS samples using multi-allelic risk stratifying instruments will be better suited to address these hypotheses,[107] especially as future GWASs provide well-powered genetic estimates of potentially relevant intermediate phenotypes (*e.g.,* brain structure morphometry, circulating immune cell phenotypes, and serum cytokine levels).[108–110] Other limitations of the HESS method, including assumptions related to sample overlap and ancestry stratification, are discussed extensively by the method's developers.[24]

Our study also identified many phenotype-pairs that demonstrated significant genome-wide correlations using the LDSC method, but for which HESS-based genome-wide and local genetic correlations could not be identified. This is unsurprising, given that the sample sizes for these phenotypes were generally below the recommended sample size for HESS analyses ($N \geq 50{,}000$).[24] Nonetheless, some of these relationships are supported by evidence from clinical and epidemiological studies, and thus may warrant follow-up using larger sample sizes and alternative methods for assessing genetic relationships. For example, we observed a modest positive correlation between self-reported hypothyroidism and major depression ($rg = 0.33 \pm 0.09$, $p = 5.0\text{x}10^{-4}$), as well as trait neuroticism ($rg = 0.25 \pm 0.06$, $p = 7.2\text{x}10^{-5}$). This could be consistent with two different sets of clinical observations. The first is that symptoms of depression are common in individuals with hypothyroidism, and that subclinical hypothyroidism could play a role in a subset of persons diagnosed with major depression; thus cross-contamination of GWAS samples could lead to a biased positive correlation. However, the second observation is that there is an increased incidence of major depression and depressive symptomatology in

persons with autoimmune thyroiditis receiving hormone replacement therapy.[111,112] It is worth noting that GWAS data for allergy, asthma, hypothyroidism, childhood ear infection, and Parkinson's disease were obtained through 23andMe, Inc.. These data are based on self-report, and thus could be more susceptible to bias stemming from misdiagnosis or misreporting, though previous work supports their validity.[113] None the less, the samples sizes are an order of magnitude larger than many other datasets, resulting in smaller standardized errors and better power for the detection of weak genetic correlations. It is yet unclear whether small magnitude genetic correlations like these might be clinically meaningful. The LDSC correlations observed presently were relatively weak magnitude (*rg*s ≈ 0.12 to 0.30) and of modest modest statistical significance ($1x10^{-5} \leq$ uncorrected $p \leq 5x10^{-3}$), when compared to the strongest genetic correlations observed within each group of datasets (*e.g.,* SZ-BD *rg* = 0.87 with $p = 7.4x10^{-94}$; CD-UC *rg* = 0.71 with $p = 3.5x10^{-36}$).

Several other significant genetic correlations are supported in the clinical and epidemiological literature. For example, we found a positive correlation between ADHD and rheumatoid arthritis (*rg* = 0.16 ± 0.05, $p = 9.0x10^{-4}$); this finds support in large registry-based studies indicating an increase in ADHD diagnosis in individuals with autoimmune disease,[114] children with mother's affected by autoimmune disease,[114] and children of mothers with rheumatoid arthritis.[115] Registry-based studies also provide support for increased incidence of ear infections (*rg* = 0.20 ± 0.05, $p = 2.0x10^{-4}$) and psoriasis (*rg* = 0.23 ± 0.07, $p = 1.0x10^{-3}$) among individuals with ADHD. [114,116–118] On the other hand, ADHD was positively correlated with CRP (*rg* = 0.23 ± 0.06, $p = 2.0x10^{-4}$), though a relatively large epidemiological study finds no association in affected individuals.[119] The negative correlation between anorexia nervosa and CRP (*rg* = -0.30 ± 0.08, *p* = 1.0x10-4) is borne out in a recent meta-analysis of relevant studies.[120] Another negative correlation between OCD and type 1 diabetes (*rg* = -0.32 ± 0.11, $p = 5.4x10^{-3}$) finds no support within a limited body of literature.[121] However, the positive correlation between Tourette syndrome and allergy (*rg* = 0.24 ± 0.06, $p = 2.7x10^{-5}$) is consistent with evidence of increased comorbidity between these phenotypes.[122,123] There is a paucity of clinical studies directly assessing the

relationship between SZ and PBC ($rg = 0.14 \pm 0.05$, $p = 2.0 \times 10^{-3}$). On the other hand, the correlation between SZ and SLE ($rg = 0.15 \pm 0.04$, $p = 2.0 \times 10^{-4}$) appears to be supported by both epidemiological evidence of increased comorbidity[124] and the well-documented (although rare) phenomenon of CNS lupus presenting with SZ-like symptoms,[125] which may contribute to misdiagnosis. Finally, positive correlations involving cigarette smoking behavior and CRP ($rg = 0.31 \pm 0.07$, $p = 3.6 \times 10^{-5}$), as well as rheumatoid arthritis ($rg = 0.17 \pm 0.05$, $p = 2.3 \times 10^{-3}$), are perhaps unsurprising given considerable evidence of elevated CRP in persons who smoke,[126] and increased incidence of smoking behavior among individuals diagnosed with rheumatoid arthritis.[127] These findings may indicate a need for more adequate statistical treatment of smoking behavior in GWAS studies.

The present study identified a number of intriguing and previously unreported genetic correlations, some of which appear to localize near established risk factors for complex disease. On the whole, these findings are consistent with the idea that similar signatures of common genetic variation may increase risk for both psychiatric and immune-related disorders. However, it is important to keep in mind that these findings do not necessarily imply causality or even shared genetic etiology. SNP-based genetic correlations could arise from a wide variety of underlying factors, including the possibility that the relationship between phenotypes is mediated by behavioral or cultural factors, or influenced by a heritable but unexamined underlying trait that confers risk to both phenotypes.[23,26] Other factors that could contribute to genetic correlations include effects mediated by parental genotypes and their influence on parental behaviors that impact the offspring.[128] Additionally, GWAS studies of psychiatric phenotypes typically do not screen affected cases on the presence of other medical conditions (and *vice-versa*), thus over-representation of a given phenotype in the sample of another phenotype could bias the data toward the detection of a genetic correlation. Finally, estimates of genetic similarities could be influenced by misdiagnosed cases.[129] Other general limitations of this method (in comparison with other approaches) have been discussed previously elsewhere.[23,26] In light of the exploratory nature of the present study, another critique pertains to the lack of clearly identified positive and negative control comparisons.

Additionally, the clinical significance of weak or modest genetic correlations is yet unclear. Future work could shed light on this topic by comparing the strength of reported genetic correlations with estimates of effect size from epidemiological associations, in order to create an atlas of concordance and shed light on the sensitivity and specificity of these genetic methods. One final critique of this approach is that it falls short of identifying plausible genetic and biological mechanisms that mediate potentially pleiotropic loci. Future work incorporating expression quantitative trait loci, differentially expressed or methylated genes, or enriched ontological and functional terms may provide a clearer context for assessing biological similarities between phenotypes. Despite these limitations, the present study indicates that shared aspects of common genetic variation may underlie long-recognized epidemiological links between psychiatric and immune-related disorders and serves as a start point for the identification and characterization of potentially pleiotropic loci.

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Legends for Tables and Supplementary Tables

Table 1. This table displays psychiatric-immune phenotype-pairs showing genome-wide genetic correlation with the linkage disequilibrium score regression (LDSC) method after correction for the total number of genetic correlations depicted in Figure 1 using the Benjamini-Hochberg (BH) method. We also report the genome-wide correlation estimates produced by the heritability estimation from summary statistics (*p*-HESS) method. Abbreviations: attention deficit-hyperactivity disorder (ADHD), bipolar disorder (BD), C-reactive protein (CRP), Crohn's disease (CD), obsessive compulsive disorder (OCD), primary biliary cirrhosis (PBC), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 2. This table displays phenotype names, data sources, and estimated SNP heritability using the linkage disequilibrium score regression (LDSC) and heritability estimation from summary statistics (HESS) methods, as well as the GWAS sample size and number of SNPs surviving quality control. Full publication references, consortia names, links to web resources, and additional details on the original studies are provided in Supplementary Table I. GWAS N denoted with * indicates the median N for all SNPs. Abbreviations: Attention deficit-hyperactivity disorder (ADHD), bipolar disorder (BD), C-reactive protein (CRP), Crohn's disease (CD), obsessive-compulsive disorder (OCD), primary biliary cirrhosis (PBC), Psychiatric Genomics Consortium (PGC), quality control (QC), single nucleotide polymorphism (SNP), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 3. This table summarizes findings of local genetic correlation analysis, including the number of significantly correlated loci before and after Benjamini-Hochberg (BH) correction for multiple testing (**shown in bold**). Loci that showed robust correlations were interrogated for co-localization with significant genome-wide associations (GWS hits, with $p < 5x10^{-8}$). The chromosomal coordinates containing GWS signal are provided, along with associated genes. Proposed candidate genes are highlighted with **bold text.** Abbreviations: Attention deficit-hyperactivity disorder (ADHD), Benjamini-Hochberg (BH), , bipolar disorder (BD), childhood ear infection (CEA), Crohn's disease (CD), hypothyroidism (HPT), comparison (NC-H), obsessive compulsive disorder (OCD), primary biliary cirrhosis (PBC), rheumatoid arthritis (RA), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 4. This table depicts the loci that showed significant (uncorrected $p < 0.05$) correlations across multiple pairs of phenotypes. **Bold font** denotes phenotype-pairs for which the locus survived BH multiple test correction. The ** symbol denotes loci at which multiple autoimmune disorders show an association reaching genome-wide significance (per immunobase.org). **Bold font** is also used to indicate proposed candidate genes. Abbreviations: Bipolar disorder (BD), Crohn's disease (CD), genome-wide significance (GWS) defined as $p < 5x10^{-8}$, hypothyroidism (HPT), primary biliary cirrhosis (PBC), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 5. Depicts the results of HESS analysis of putative causal directionality. Within this analysis, local genetic correlations are examined within loci containing GWS associations for each phenotype. The phenotype for which GWS loci produce the larger local correlations suggests that genetic liability for this phenotype may contribute to genetic risk for the other, especially when the correlation error bounds of the second phenotype overlap with zero. When both phenotypes show correlations overlapping with zero, no directionality is supported. Abbreviations: Crohn's disease (CD), genome-wide significance (GWS) defined as $p < 5x10^{-8}$, primary biliary cirrhosis (PBC), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Supplementary Table 1. GWAS Sample Information and Single Phenotype Statistics, MHC Excluded.

Supplementary Table 2. LDSC Psychiatric-Immune Correlations

Supplementary Table 3. HESS Local Genetic Correlations.

Supplementary Table 4. LDSC Immune-Immune Correlations

Figure Legends.

Figure 1. A heatmap depicting LDSC genome-wide genetic correlations between psychiatric and immune-related conditions such that red reflects more positive correlation coefficients while blue reflects more negative coefficients. Correlation coefficients are provided within each cell, with full details provided in Supplementary Table 2. Correlations reaching trend-level significance ($0.05 <$ uncorrected $p < 0.10$) are depicted as colored panels, while relationships surpassing uncorrected $p < 0.05$ are additionally denoted with *, and relationships surpassing BH-$p < 0.05$ (for the total number of tests depicted in the figure) are denoted with **. The rows and columns of the heatmap are hierarchically

clustered based on correlation coefficients. Abbreviations: Attention deficit-hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD).

Figure 2. This figure depicts the HESS local genetic correlation data with respect to the genome and previously reported genome-wide association signals for respective disorders. A model genome using HG19 coordinates is depicted in grey. Moving outward from the center of the plot, the first track containing a red histogram depicts loci significantly associated with SZ (GWAS $p < 5x10^{-8}$), with larger peaks indicating more significance (plotted as -log(p-value)). The second track (labeled SZ-CD) depicts regions of genetic correlation between SZ and CD, such that blue reflects uncorrected $p < 0.05$ and red reflects BH corrected $p < 0.05$. The next track (labeled CD Hits) contains a histogram depicting CD GWAS signal as described previously. The next pair of tracks depict genetic correlations for SZ-PBC and PBC GWAS signal, respectively. The third pair of tracks depicts this information for SZ-SLE (with SLE GWAS signal). The fourth pair of tracks depicts this information for SZ-UC and UC GWAS signal, respectively. In the center of the plot, we identify several GWAS candidate genes using colored text and arrows to indicate the pertinent locus; colored text and arrows are used to indicate the relevant phenotype-pairs, such that green = SZ-CD, orange = SZ-PBC, yellow = SZ-SLE, brown = SZ-PBC/SLE, and purple = SZ/BD-CD/PBC/UC.

Supplementary Figure 1. Depicts the relationship between LDSC and HESS genome-wide genetic correlation coefficients (pearson $r = 0.25$, $p = 0.25$).

Supplementary Figure 2. Depicts the absolute value of the difference between LDSC and HESS genome-wide genetic correlation coefficients and the average sample size of the two contributing GWAS studies (pearson $r = -0.44$, $p = 0.035$).

Supplementary Figure 3. Depicts differences in LDSC-based genome-wide correlations based on dataset selection and pre-filtering decisions for a select set of phenotypes. Each dataset is coded with the GWAS first author's name and the filtering threshold. 1KGMAF>=05% reflects retention of SNPs with minor allele frequencies $\geq$ 5% within the thousand genomes phase 3 reference panel. INFO>=90% reflects retention of SNPs with imputation quality scores $\geq$ 0.9. ALL SNPs indicates that no SNPs were filtered, because INFO score was not available for these data. Correlations reaching trend-level significance ($0.05 <$ uncorrected $p < 0.10$) are depicted as colored panels, while relationships surpassing uncorrected $p < 0.05$ are additionally denoted with *, and relationships surpassing BH-$p < 0.05$ (for the total number of tests depicted in Supplementary Figure 2) are denoted with **.

Supplementary Figure 4. Depicts differences in LDSC-based genome-wide correlations based on dataset selection and pre-filtering decisions for a select set of phenotypes in relation to the larger set of phenotypes. Datasets that were differentially processed are indicated with first author's name and the filtering threshold. 1KGMAF>=05% reflects retention of SNPs with minor allele frequencies $\geq$ 5% within the thousand genomes phase 3 reference panel. INFO>=90% reflects retention of SNPs with imputation quality scores $\geq$ 0.9. ALL SNPs indicates that no SNPs were filtered, because INFO score was not available for these data. Correlations reaching trend-level significance ($0.05 <$ uncorrected $p < 0.10$) are depicted as colored panels, while relationships surpassing uncorrected $p < 0.05$ are additionally denoted with *, and relationships surpassing BH-$p < 0.05$ (for the total number of tests depicted in Supplementary Figure 2) are denoted with **. Full results are provided in Supplementary Table 2.

Manuscript Abbreviations

Attention deficit-hyperactivity disorder (ADHD), Benjamini-Hochberg (BH), bipolar disorder (BD), C-reactive protein (CRP), Crohn's disease (CD), genome-wide association study (GWAS), genome-wide significant associations (GW hits), heritability estimation from summary statistics (HESS), linkage disequilibrium (LD), linkage disequilibrium score regression (LDSC), major histocompatibility (MHC), obsessive compulsive disorder (OCD), primary biliary cirrhosis (PBC), Psychiatric Genomics Consortium (PGC), quality control (QC), restricted maximum likelihood (REML), schizophrenia (SZ), single nucleotide polymorphism (SNP), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 1. Significant Genome-Wide Psychiatric-Immune Genetic Correlations

Psychiatric Phenotype	Immune-Related Phenotype	LDSC Correlation ± Error, Uncorrected p-Value	HESS Correlation ± Error
ADHD	CRP	0.23 ± 0.06, $p = 2.0\text{x}10^{-4}$	0.21 ± 0.04
ADHD	Childhood Ear Infection	0.20 ± 0.05, $p = 2.0\text{x}10^{-4}$	0.14 ± 0.03
ADHD	Psoriasis	0.23 ± 0.07, $p = 1.0\text{x}10^{-3}$	1.99 ± 0.20
ADHD	Rheumatoid Arthritis	0.16 ± 0.05, $p = 9.0\text{x}10^{-4}$	0.29 ± 0.04
ADHD	Tuberculosis Susceptability	0.36 ± 0.11, $p = 1.6\text{x}10^{-3}$	0.87 ± 0.25
Anorexia Nervosa	CRP	-0.30 ± 0.08, $p = 1.0\text{x}10^{-4}$	-0.53 ± 0.12
BD	Celiac Disease	0.34 ± 0.08, $p = 4.5\text{x}10^{-5}$	1.91 ± 0.12
BD	CD	0.22 ± 0.06, $p = 5.0\text{x}10^{-4}$	1.31 ± 0.07
BD	Psoriasis	0.29 ± 0.07, $p = 2.7\text{x}10^{-5}$	5.76 ± 0.58
BD	UC	$0.23 + 0.07$, $p = 1.5\text{x}10^{-3}$	1.59 ± 0.08
Cigarettes (Ever-Smoked)	CRP	0.31 ± 0.07, $p = 3.6\text{x}10^{-5}$	2.24 ± 0.73
Cigarettes (Ever-Smoked)	Rheumatoid Arthritis	0.17 ± 0.05, $p = 2.3\text{x}10^{-3}$	0.51 ± 0.22
Major Depression	Hypothyroidism	0.33 ± 0.09, $p = 5.0\text{x}10^{-4}$	0.45 ± 0.09
Neuroticism	Childhood Ear Infection	0.13 ± 0.04, $p = 8.0\text{x}10^{-4}$	0.06 ± 0.01
Neuroticism	Hypothyroidism	0.25 ± 0.06, $p = 7.2\text{x}10^{-5}$	0.03 ± 0.01
OCD	Type 1 Diabetes	$-0.32 + 0.11$, $p = 5.4\text{x}10^{-3}$	0.98 ± 0.18
SZ	CD	0.12 ± 0.03, $p = 2.0\text{x}10^{-4}$	0.31 ± 0.03
SZ	PBC	0.14 ± 0.05, $p = 2.0\text{x}10^{-3}$	0.88 ± 0.05
SZ	SLE	0.15 ± 0.05, $p = 1.2\text{x}10^{-3}$	0.12 ± 0.02
SZ	UC	0.14 ± 0.04, $p = 2.0\text{x}10^{-4}$	0.56 ± 0.03
Tourette's Syndrome	Allergy (Any)	0.24 ± 0.06, $p = 2.7\text{x}10^{-5}$	0.29 ± 0.07

Table 1. This table displays psychiatric-immune phenotype-pairs showing genome-wide genetic correlation with the linkage disequilibrium score regression (LDSC) method after correction for the total number of genetic correlations depicted in Figure 1 using the Benjamini-Hochberg (BH) method. We also report the genome-wide correlation estimates produced by the heritability estimation from summary statistics (*p*-HESS) method. Abbreviations: attention deficit-hyperactivity disorder (ADHD), bipolar disorder (BD), C-reactive protein (CRP), Crohn's disease (CD), obsessive compulsive disorder (OCD), primary biliary cirrhosis (PBC), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 2. Sample Characteristics for Phenotypes Involved in Significant Correlations

Phenotype	Data Source	Estimated Genome-Wide SNP Heritability ± Error (LDSC / HESS)	GWAS *N*	QC-Positive SNPS (MHC Excluded)
ADHD	Demontis *et al.* (2017)	0.24 ± 0.02 / 0.26 ± 0.02	53,293	1,004,958
Allergy (Any, Self-Report)	The 23andMe Research Team	0.08 ± 0.01 / 0.15 ± 0.01	181,000	1,060,611
Anorexia Nervosa	Duncan *et al.* (2017)	0.26 ± 0.04 / 0.09 ± 0.04	14,477	1,054,719
BP	Hou *et al.,* (2016)	0.20 ± 0.02 / 0.14 + 0.02	40,225	1,052,397
Childhood Ear Infection	The 23andMe Research Team	0.07 ± 0.01 / 0.10 ± 0.01	122,000	1,060,612
Celiac Disease	Dubois *et al.,* (2010)	0.30 ± 0.05 / 0.13 ± 0.04	15,283	271,764
Cigarettes (Ever-Smoked)	Tobacco and Genetics Consortium	0.07 ± 0.01 / 0.01 ± 0.02	74,035	963,355
CD	Liu *et al.* (2015)	0.47 ± 0.06 / 0.33 ± 0.03	21,389	1,062, 075
CRP	Dehghan *et al.* (2011)	0.13 + 0.02 / 0.11 ± 0.02	66,185	965,855
Hypothyroidism (Self-Report)	The 23andMe Research Team	0.05 + 0.01 / 0.08 ± 0.01	135,000	1,060,612
Major Depression	PGC Depression Working Group	0.14 ± 0.03 / 0.07 ± 0.04	18,759	967,534
Neuroticism	Social Science Genetics Consortium	0.09 ± 0.01 / 0.44 ± 0.01	168,105	1,053712
OCD	PGC OCD/TS Working Group	0.29 ± 0.05 / 0.09 ± 0.04	10,215*	1,054,746
PBC	Cordell *et al.,* (2015)	0.37 + 0.06 / 0.17 ± 0.04	13,239	940,715
Psoriasis	Tsoi *et al.,* (2015)	0.82 ± 0.13 / 0.09 ± 0.04	5,116*	1,037,355
Rheumatoid Arthritis	Okada *et al,.* (2014)	0.14 + 0.02 / 0.10 ± 0.01	58,284	1,051,805
SZ	PGC Schizophrenia Working Group	0.47 ± 0.02 / 0.62 ± 0.01	77,096	1,061,529
SLE	Bentham *et al.,* (2015)	0.27 ± 0.05 / 0.27 ± 0.03	23,210	1,056,783
Tourette Syndrome	PGC OCD/TS Working Group	0.35 ± 0.04 / 0.08 ± 0.05	13,341*	1,041, 689
Tuberculosis Susceptability	Curtis *et al.,* (2015)	0.18 ± 0.05 / 0.02 ± 0.05	11,936	819,917
Type 1 Diabetes	Bradfield *et al.,* (2011)	0.18 ± 0.03 / 0.15 ± 0.03	26,890	854,164
UC	Liu *et al.,* (2015)	0.25 ± 0.03 / 0.23 ± 0.03	27,432	1,062,094

Table 2. This table displays phenotype names, data sources, and estimated SNP heritability using the linkage disequilibrium score regression (LDSC) and heritability estimation from summary statistics (HESS) methods, as well as the GWAS sample size and number of SNPs surviving quality control. Full publication references, consortia names, links to web resources, and additional details on the original studies are provided in Supplementary Table I. GWAS N denoted with * indicates the median N for all SNPs. Abbreviations: Attention deficit-hyperactivity disorder (ADHD), bipolar disorder (BD), C-reactive protein (CRP), Crohn's disease (CD), obsessive-compulsive disorder (OCD), primary biliary cirrhosis (PBC), Psychiatric Genomics Consortium (PGC), quality control (QC), single nucleotide polymorphism (SNP), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 3. Significant Local Genetic Correlations Based on HESS Analysis

Phenotype Pair	# of Correlated Loci (BH p < .05 / p < .05) with GWS Hits and Associated Genes Contained within Correlated Loci (BH p < 0.05)
ADHD-CRP	0 / 7
ADHD-CEA	0 / 3
ADHD-Psoriasis	0 / 5
ADHD-RA	0 / 5
ADHD-Tuberculosis	0 / 0
Anorexia Nervosa-CRP	0 / 0
BD-Celiac Disease	0 / 30
BD -CD	0 / 12
BD -Psoriasis	0 / 3
BD -UC	0 / 5
Cigarettes (Ever-Smoked)-CRP	0 / 0
Cigarettes (Ever-Smoked)-RA	0 / 0
Major Depression-HPT	0 / 0
Neuroticism-CEA	0 / 14
Neuroticism-HPT	0 / 15
OCD-Type 1 Diabetes	0 / 1
SZ-CD	**32** / 251 SZ 4:102921704-103198082** (*ACTR3BD4, BDH2, CENPE, **SLC39A8**, SLC9B1, SLC9B2*) CD 4:103188709-103198082** (*CENPE)* CD 8:126529074-126568355 (*FAM84B*) CD 10:64301873-64588424 (No Genes) CD 12:40337163-40815560 (*CNTN1, **LRRK2**, MUC19, RNU6-713P*); CD 21:16790941-16841303 (No Genes)
SZ-PBC	**37** / 256 SZ 1:30427639-30437268 (No Genes) SZ 10:18725659-18816236 (*AIFM1P1, **CACNB2***) PBC 3:16955259-16955259** (***PLCL2***) PBC 11:118579747-118743772** (*ARCN1, **CXCR5, DDX6**, MIR6716, PHLDB1, RNU6-1157P, RNU6-376P, **TREH**, TREHP*) PBC 22:39670851-39747780 (***CACNA1I,** ENTHD1*)

SZ-SLE	**20** / 200 SZ 1:149999764-150507233 (*ANP32E, **APH1A**, C1orf54, CA14, CIART, MIR6878, MRPS21, OTUD7B, PLEKHO1, PRPF3, RN7SL480P, RNU2-17P, RPRD2, TARS2, VPS45*) SZ 2:58377014-58383820 (*FANCL, VRK2*) SLE 1:161444369-161501904 ** (***FCGR2A***) SLE 7:128562446-128771234 (*CALU, CICP14, FAM71F1, FAM71F2, IMP3P2, RN7SL81P, RNA5SP242, RNA5SP243, RNU6-177P*) SLE 8:11332026-11394233 (*FAM167A-AS1, RN7SL293P, RNU6-1084P, SLC35G5, TDH*) SLE 22:21910280-21999229** (***MAPK1**, PPM1F, PRAMENP, TOP3B, **UBE2L3***)
SZ-UC	**8** / 205 UC 11:63804569-65898631** (*CCDC88B, RPS6KA4, TRPT1, FLRT1*)
Tourette's Syndrome-Allergy	0 / 0

Table 3. This table summarizes findings of local genetic correlation analysis, including the number of significantly correlated loci before and after Benjamini-Hochberg (BH) correction for multiple testing (**shown in bold**). Loci that showed robust correlations were interrogated for co-localization with significant genome-wide associations (GWS hits, with $p < 5x10^{-8}$). The chromosomal coordinates containing GWS signal are provided, along with associated genes. Proposed candidate genes are highlighted with **bold text.** Abbreviations: Attention deficit-hyperactivity disorder (ADHD), Benjamini-Hochberg (BH), , bipolar disorder (BD), childhood ear infection (CEA), Crohn's disease (CD), hypothyroidism (HPT), comparison (NC-H), obsessive compulsive disorder (OCD), primary biliary cirrhosis (PBC), rheumatoid arthritis (RA), schizophrenia (SZ), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 4. Loci Implicated Across Multiple Phenotype-Pairs at Uncorrected $p < 0.05$

Locus	# of Pairs	Phenotype Pairs	GWS Associations and Nearby Genes
17:36809344-38877404	5	BD-CD, BD-UC, SZ-CD, SZ-PBC, SZ-UC	BP 17: 37839493-37893484 (***ERBB2***) / CD 17:37912377-38064876 / SLE 17: 38007190-38007319 / PBC 17:37912377-38080865 / UC 17: 37903731-38089717 (*RNU6-489P, TBC1D3C, TBC1D3D, TBC1D3K, TBC1D3L*)
1:200137649-201589975	4	BD-CD, BD-UC, **SZ-PBC**, SZ-UC	CD 1:200599616-201069559** / UC 1: 200864267-201024059** (*C1orf106,* ***CACNA1S****, GPR25,* ***KIF21B***)
2:69139564-70755198	4	BD-CD, SZ-CD, SZ-SLE, SZ-UC	None
3:38356116-40221298	4	Neuroticism-HPT, SZ-PBC, SZ-SLE, SZ-UC	None
6:17386405-19207487	4	SZ-CD, SZ-PBC, SZ-SLE, SZ-UC	None
8:11278998-13491775	4	Neuroticism-HPT, SZ-CD, **SZ-PBC**, **SZ-SLE**	Neuroticism 8:11281273-11895516 / SLE 8:11426026-11546260** **(*BLK*, *C8orf49, CTSB, FAM167A, FAM167A-AS1, FDFT1, GATA4, LINC00208, MTMR9, NEIL2, RN7SL293P, RNU6-1084P, SLC35G5, SUB1P1, TDH)***
8:9640787-10463197	4	Neuroticism-HPT, SZ-PBC, SZ-SLE, SZ-UC	Neuroticism 8:9793601-10459000 (LINC00599, MIR124-1, MSRA)
11:27020461-28481593	4	SZ-CD, **SZ-PBC**, SZ-SLE, SZ-UC	None
22:19912358-22357325	4	SZ-CD, SZ-PBC, **SZ-SLE**, SZ-UC	CD 22:21916166-21985094** / SLE 22: 21910280-21999229** (*CCDC116,* ***MAPK1****, RIMBP3,* ***UBE2L3****, YDJC*)

Table 4. This table depicts the loci that showed significant (uncorrected $p < 0.05$) correlations across multiple pairs of phenotypes. **Bold font** denotes phenotype-pairs for which the locus survived BH multiple test correction. The ** symbol denotes loci at which multiple autoimmune disorders show an association reaching genome-wide significance (per immunobase.org). **Bold font** is also used to indicate proposed candidate genes. Abbreviations: Bipolar disorder (BD), Crohn's disease (CD), genome-wide significance (GWS) defined as $p < 5x10^{-8}$, hypothyroidism (HPT), primary biliary cirrhosis (PBC), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

Table 5. HESS Analysis of Putative Causal Directionality

Phenotype 1, Phenotype 2	Local Genetic Correlation ± Error at Loci Reaching GWS Only for Phenotype 1	Local Genetic Correlation ± Error at Loci Reaching GWS Only for Phenotype 2	Suggested Direction
SZ-CD	0.37 ± 0.09	0.11 ± 0.08	SZ ➔ CD
SZ-PBCs	0.58 ± 0.18	0.26 ± 0.17	SZ ➔ PBC
SZ-SLE	0.26 ± 0.13	0.16 ± 0.16	SZ ➔ SLE
SZ-UC	0.43 ± 0.09	0.16 ± 0.10	SZ ➔ UC

Table 5. Depicts the results of HESS analysis of putative causal directionality. Within this analysis, local genetic correlations are examined within loci containing GWS associations for each phenotype. The phenotype for which GWS loci produce the larger local correlations suggests that genetic liability for this phenotype may contribute to genetic risk for the other, especially when the correlation error bounds of the second phenotype overlap with zero. When both phenotypes show correlations overlapping with zero, no directionality is supported. Abbreviations: Crohn's disease (CD), genome-wide significance (GWS) defined as $p < 5x10^{-8}$, primary biliary cirrhosis (PBC), systemic lupus erythematosus (SLE), ulcerative colitis (UC).

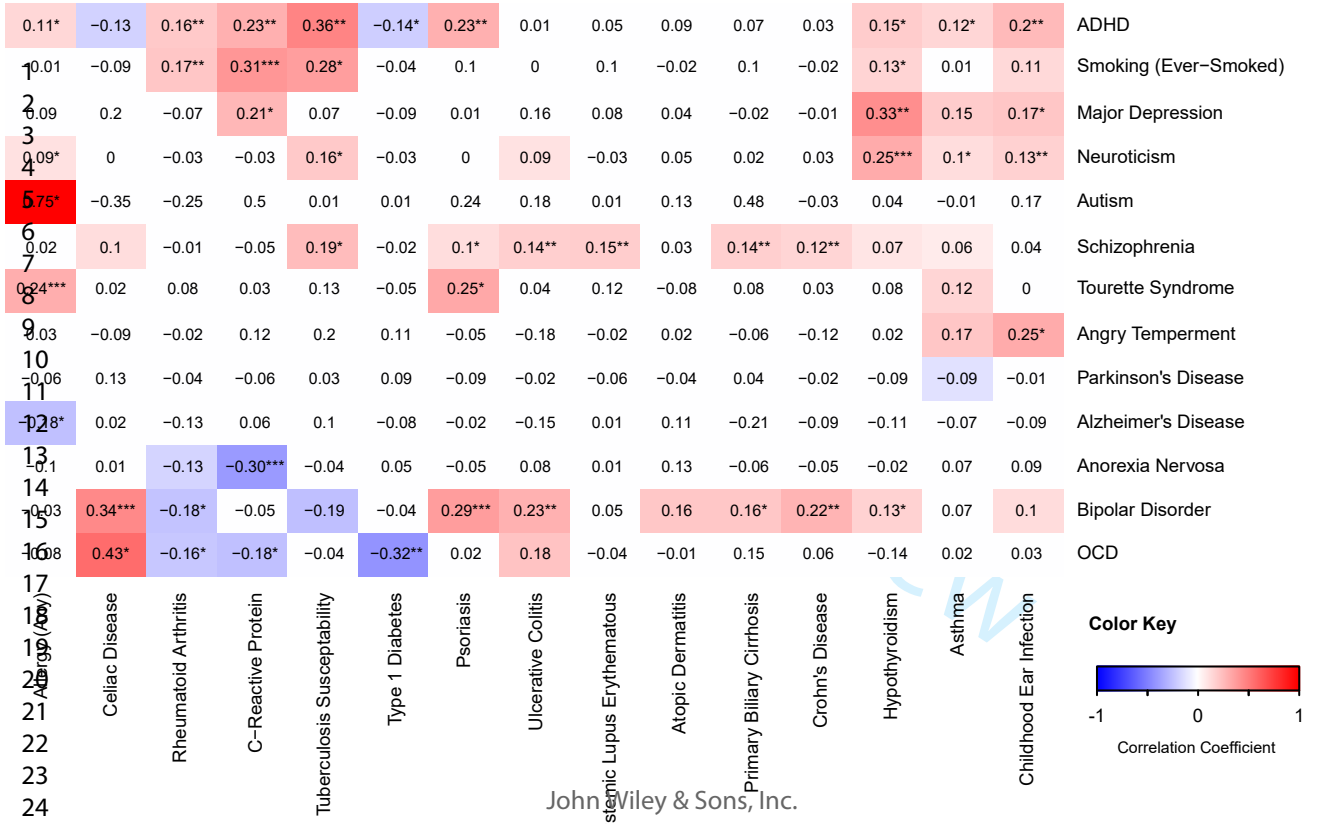
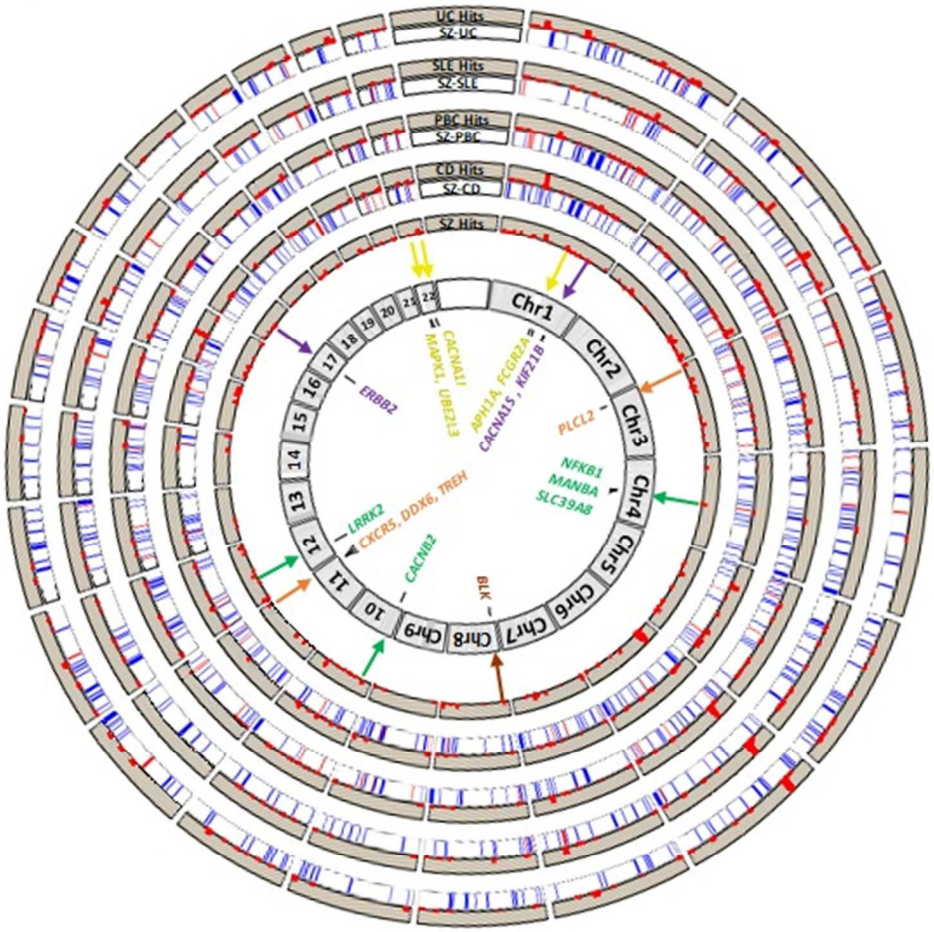


Figure 2



This figure depicts the HESS local genetic correlation data with respect to the genome and previously reported genome-wide association signals for respective disorders. A model genome using HG19 coordinates is depicted in grey. Moving outward from the center of the plot, the first track containing a red histogram depicts loci significantly associated with SZ (GWAS $p < 5x10\text{-}8$), with larger peaks indicating more significance (plotted as -log(p-value)). The second track (labeled SZ-CD) depicts regions of genetic correlation between SZ and CD, such that blue reflects uncorrected $p < 0.05$ and red reflects BH corrected $p < 0.05$. The next track (labeled CD Hits) contains a histogram depicting CD GWAS signal as described previously. The next pair of tracks depict genetic correlations for SZ-PBC and PBC GWAS signal, respectively. The third pair of tracks depicts this information for SZ-SLE (with SLE GWAS signal). The fourth pair of tracks depicts this information for SZ-UC and UC GWAS signal, respectively. In the center of the plot, we identify several GWAS candidate genes using colored text and arrows to indicate the pertinent locus; colored text and arrows are used to indicate the relevant phenotype-pairs, such that green = SZ-CD, orange = SZ-PBC, yellow = SZ-SLE, brown = SZ-PBC/SLE, and purple = SZ/BD-CD/PBC/UC.

152x157mm (96 x 96 DPI)

Supplementary Text: Genetic correlations among psychiatric and immune-related phenotypes based on genome-wide association data.

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Correlations among Immune-Inflammatory Phenotypes

In addition to correlations between psychiatric and immune-related phenotypes, we also examined the correlations among the set of immune-related phenotypes, some of which have not previously been examined using the LD score regression (LDSC) method. We observed several highly significant correlations, which are depicted in Supplementary Figure 5, with full summary statistics in Supplementary Table 4. Specifically, thirty-one correlations survived family-wise BH correction.

Among the inflammatory bowel disorders, celiac disease was positively correlated with Crohn's disease ($rg = 0.27 \pm 0.08$, uncorrected $p = 8.0\text{x}10^{-4}$), rheumatoid arthritis ($rg = 0.24 \pm 0.08$, $p = 2.2\text{x}10^{-3}$), type 1 diabetes ($rg = 0.32 \pm 0.09$, $p = 6.0\text{x}10^{-4}$), allergy ($rg = 0.19 \pm 0.07$, $p = 6.8\text{x}10^{-3}$), hypothyroidism ($rg = 0.38 \pm 0.09$, $p = 2.0\text{x}10^{-5}$), and psoriasis ($rg = 0.23 \pm 0.09$, $p = 0.01$). Crohn's disease was additionally positively correlated with ulcerative colitis ($rg = 0.71 \pm 0.06$, $p = 3.5\text{x}10^{-36}$), psoriasis ($rg = 0.34 \pm 0.07$, $p = 2.3\text{x}10^{-7}$), and primary biliary cirrhosis ($rg = 0.24 \pm 0.08$, $p = 1.6\text{x}10^{-3}$). Ulcerative colitis was likewise positively correlated with psoriasis ($rg = 0.39 \pm 0.08$, $p = 1.6\text{x}10^{-6}$) and primary biliary cirrhosis ($rg = 0.32 \pm 0.09$, $p = 4.0\text{x}10^{-4}$), as well as susceptibility pulmonary tuberculosis ($rg = 0.34 \pm 0.14$, $p = 0.14$).

Rheumatoid arthritis was found to be positively correlated with type 1 diabetes ($rg = 0.41 \pm 0.14$, $p = 2.1\text{x}10^{-3}$), hypothyroidism ($rg = 0.34 \pm 0.07$, $p = 7.4\text{x}10^{-6}$), primary biliary cirrhosis ($rg = 0.27 \pm 0.08$, $p = 1.4\text{x}10^{-3}$), psoriasis ($rg = 0.17 \pm 0.07$, $p = 0.01$), and systemic lupus erythematosus ($rg = 0.46 \pm 0.06$, $p = 1.8\text{x}10^{-13}$). Allergy was positively correlated with susceptibility to pulmonary tuberculosis ($rg = 0.22 \pm 0.08$, $p = 8.1\text{x}10^{-3}$), asthma ($rg = 0.79 \pm 0.04$, $p = 2.0\text{x}10^{-107}$), atopic dermatitis ($rg = 0.25 \pm 0.07$, $p = 2.0\text{x}10^{-4}$), childhood ear infections ($rg = 0.22 \pm 0.05$, $p = 2.9\text{x}10^{-6}$), CRP ($rg = 0.13 \pm 0.05$, $p = 5.4\text{x}10^{-3}$), and hypothyroidism ($rg = 0.20 \pm 0.05$, $p = 4.0\text{x}10^{-5}$). Asthma was positively correlated with atopic dermatitis ($rg = 0.39 \pm 0.07$, $p = 1.5\text{x}10^{-7}$), childhood ear infections ($rg = 0.15 \pm 0.04$, $p = 3.0\text{x}10^{-4}$), and CRP ($rg = 0.17 \pm 0.05$, $p = 6.0\text{x}10^{-4}$).

Finally, hypothyroidism was positively correlated with type 1 diabetes ($rg = 0.40 \pm 0.10$, $p = 4.6\text{x}10^{-5}$), childhood ear infections ($rg = 0.14 \pm 0.05$, $p = 5.4\text{x}10^{-3}$), and primary biliary cirrhosis ($rg =$

0.24 ± 0.09, $p = 7.6\text{x}10^{-3}$). Primary biliary cirrhosis was additionally positively correlated with psoriasis ($rg = 0.27 \pm 0.10$, $p = 5.4\text{x}10^{-3}$) and systemic lupus erythematosus ($rg = 0.62 \pm 0.08$, $p = 2.2\text{x}10^{-13}$).

GWAS Identifier	Estimated Heritability based on LD Score Regression Method (Color Scaled To Number)
12_i_iganeph.sumstats	0.142
14a_i_HAND_dementia.txt.sumstats	0.5305
14a_i_HAND_exec.txt.sumstats	0.0705
14a_i_HAND_neuronba.txt.sumstats	-0.1497
14a_i_HAND_speed.txt.sumstats	0.0052
14a_i_hiv_control.sumstats	0.2895
14c_i_tb.sumstats	0.1752
21_i_psorarth.sumstats	0.2265
22_i_RA_okada.sumstats	0.1386
23_i_sarcoid.sumstats	0.9692
24_i_sclero.sumstats	0.2049
28_i_t1d.sumstats	0.1783
3_i_allergyany.sumstats	0.0808
3_i_asthma.sumstats	0.0685
3_i_atopicdermatitis.sumstats	0.0772
3_i_childhoodear.sumstats	0.0719
3_i_crp.sumstats	0.1298
3_i_hypothyroid.sumstats	0.0539
3_i_pbc.sumstats	0.3716
3_i_psoriasis.sumstats	0.8165
3_i_sle.sumstats	0.2676
30_i_wegners.sumstats	0.1074
31b_i_cort.sumstats	0.0605
32a_i_myeloid.sumstats	0.2626
36_b_anger_temp.sumstats	0.2114
36_b_borderline.sumstats	-0.0073
36_b_p_agree.sumstats	0.019
36_b_p_conc.sumstats	0.0732
36_b_p_extrav.sumstats	0.041
36_b_p_neuroticism.sumstats	0.0192
36_b_p_openess.sumstats	0.1238
37_b_37_etoh_cc.sumstats	0.0931
37_b_etoh_cont.sumstats	0.7406
37_b_37_opiate_cont.sumstats	0.8496
37_b_cocaine_cont.sumstats	0.7143
37_b_sub_cigperday.sumstats	0.0348
37_b_sub_evrsmk.sumstats	0.0715
38_b_neuroticism.sumstats	0.0933
39_b_psy_adhd.sumstats	0.2366
39_b_psy_alz.sumstats	0.0794
39_b_psy_anor.sumstats	0.2609

39_b_psy_anx_cc.sumstats	0.0713
39_b_psy_anx_score.sumstats	0.0727
39_b_psy_asd.sumstats	0.3387
39_b_psy_bipolar_05.sumstats	0.4399
39_b_psy_bipolar_info9.sumstats	0.4374
39_b_psy_bipolar_conligen_1kgMAF05.sumstats	0.201
39_b_psy_bipolar_conligen_all.sumstats	0.2058
39_b_psy_mddprimary_nomhc.sumstats	0.1425
39_b_psy_ocd.sumstats	0.293
39_b_psy_parkinson.sumstats	0.0257
39_b_psy_ptsd.sumstats	0.0776
39_b_psy_sz_eur_05.sumstats	0.4559
39_b_psy_sz_eur_info9.sumstats	0.4561
39_b_psy_td.sumstats	0.3491
40_b_adol_alc.sumstats	0.0743
40_b_beh_pureLI.sumstats	0.0843
40_b_beh_pureRD.sumstats	0.1881
40_b_beh_RDLI.sumstats	0.1315
5_i_celiac.sumstats	0.3045
6_i_crohns_franke_05.sumstats	0.4747
6_i_crohns_franke_all.sumstats	0.4672
6_i_crohns_liu_05.sumstats	0.4655
6_i_crohns_liu_info9.sumstats	0.4782
7_i_uc_andersen_05.sumstats	0.2216
7_i_uc_andersen_all.sumstats	0.2413
7_i_uc_liu_05.sumstats	0.2499
7_i_uc_liu_info9.sumstats	0.2526
9_i_eoe.sumstats	0.1832

Error of Estimated Heritability based on LD Score Regression Method	Z-score of Estimated Heritability	GWAS *N* (provided as median, min, max; if N was supplied per SNP)	Phenotype Retained
0.0923	1.538461538	4603	No
0.3231	1.64190653	1287, 1183, 1287	No
0.4082	0.172709456	1138, 1040, 1138	No
0.3487	-0.429308861	1287, 1183, 1287	No
0.4007	0.01297729	1131, 1036, 1131	No
0.1349	2.146034099	3622	No
0.0495	3.539393939	11936	Yes
0.1316	1.72112462	3967	No
0.019	7.294736842	58284	Yes
0.2988	3.243641232	1870	No
0.0863	2.374275782	7444	No
0.0328	5.43597561	26890, 26890, 26890	Yes
0.0056	14.42857143	181000	Yes
0.0079	8.670886076	157000	Yes
0.0165	4.678787879	40529, 469, 40835	Yes
0.006	11.98333333	122000	Yes
0.0195	6.656410256	66185	Yes
0.0075	7.186666667	135000	Yes
0.0627	5.926634769	13239	Yes
0.129	6.329457364	5116,671, 5116	Yes
0.0471	5.681528662	23210	Yes
0.3044	0.35282523	1962	No
0.0358	1.689944134	12592, 433, 12593	No
0.1365	1.923809524	3198	No
0.0579	3.651122625	8736, 8303, 8747	Yes
0.111	-0.065765766	7325, 7269, 7325	No
0.0301	0.631229236	17375	No
0.0335	2.185074627	17375	No
0.0295	1.389830508	17375	No
0.0314	0.611464968	17375	No
0.0309	4.006472492	17375	No
0.0668	1.393712575	3931, 3931, 3931	No
0.0863	8.581691773	6720, 6720, 6720	No
0.0924	9.194805195	6720, 6720, 6720	No
0.0909	7.858085809	6720, 6720, 6720	No
0.0083	4.192771084	68028	Yes
0.0071	10.07042254	74035	Yes
0.0067	13.92537313	168105	Yes
0.0171	13.83625731	53293	Yes
0.0135	5.881481481	54162	Yes
0.039	6.68974359	14477	Yes

0.0314	2.270700637	17310, 613.99, 17310	No
0.0282	2.578014184	17310, 613.99, 17310	No
0.0259	13.07722008	13574	Yes
0.0399	11.02506266	16731	Yes
0.0365	11.98356164	16731	Yes
0.0152	13.22368421	40255	Yes
0.0149	13.81208054	40255	Yes
0.0265	5.377358491	18759	Yes
0.0544	5.386029412	10215, 1604, 10215	Yes
0.0027	9.518518519	335000	Yes
0.0454	1.709251101	20070	No
0.0178	25.61235955	77096	Yes
0.0192	23.75520833	77096	Yes
0.0438	7.970319635	13341, 1097, 13341	Yes
0.101	0.735643564	4304	No
0.1092	0.771978022	4291	No
0.1112	1.691546763	4280	No
0.112	1.174107143	4470	No
0.0494	6.163967611	15283	Yes
0.0665	7.138345865	21389	Yes
0.0603	7.747927032	21389	Yes
0.0562	8.282918149	20883	Yes
0.0551	8.67876588	20883	Yes
0.0368	6.02173913	21389	Yes
0.0352	6.855113636	21389	Yes
0.032	7.809375	27432	Yes
0.0328	7.701219512	27432	Yes
0.0899	2.0378198	6346, 6342, 6347	No

Phenotype Description	Full Citation
IgA Nephropathy	Kiryluk K, Li Y, Scolari F, et al. Discovery
Dementia among HIV infected indviduals (case	Levine AJ, Service S, Miller EN, et al. Ge
Executive function among HIV infected individ	Levine AJ, Service S, Miller EN, et al. Ge
Neurocognitive impairment among HIV infecte	Levine AJ, Service S, Miller EN, et al. Ge
Processing speed among HIV infected individu	Levine AJ, Service S, Miller EN, et al. Ge
HIV viral load control in unmedicated patients	The_International_HIV_Controllers_Stu
Vulnerability to tuberculosis infection	Curtis J, Luo Y, Zenner HL, et al. Suscep
Psoriatic arthritis	Ellinghaus E, Stuart PE, Ellinghaus D, et
Rheumatoid arthritis	Okada Y, Wu D, Trynka G, et al. Genetic
Sarcoidosis	Hofmann S, Fischer A, Nothnagel M, et
Systemic sclerosis / scleroderma	Radstake TRDJ, Gorlova O, Rueda B, et
Type 1 diabetes	Bradfield JP, Qu HQ, Wang K, et al. A ge
Allergy (Any, Self-Report)	Pickrell, J. K., Berisa, T., Liu, J. Z., Ségure
Asthma (Self-Report)	Hinds, D. A., McMahon, G., Kiefer, A. K.
Atopic dermatitis	EArly Genetics and Lifecourse Epidemic
Childhood Ear Infeciton (Self-Report)	Pickrell, J. K., Berisa, T., Liu, J. Z., Ségure
C-Reactive Protein	Dehghan, A., Dupuis, J., Barbalic, M., Bi
Hypothyroidism (Self-Report)	Pickrell, J. K., Berisa, T., Liu, J. Z., Ségure
Primary Biliary Cirrhosis	Cordell, H. J., Han, Y., Mells, G. F., Li, Y.
Psoriasis	Tsoi, L. C., Spain, S. L., Ellinghaus, E., Stu
Systemic Lupus Erythematous	Bentham, J., Morris, D. L., Cunningham
Granulomatosis with polyangitis / Wegner's gr	Xie G, Roshandel D, Sherva R, et al. Ass
Morning plasma cortisol	Bolton JL, Hayward C, Direk N, et al. Ge
Myeloid leukemias	Tapper W, Jones A V., Kralovics R, et al.
Anger proneness - temperment	Mick E, McGough J, Deutsch CK, Frazier
Borderline personality disorder	Lubke GH, Laurin C, Amin N, et al. Genc
Big Five personality - agreeableness	de Moor MHM, Costa PT, Terracciano A
Big Five personality - conscientiousness	de Moor MHM, Costa PT, Terracciano A
Big Five personlaity -extraversion	de Moor MHM, Costa PT, Terracciano A
Big Five personality - neuroticism	de Moor MHM, Costa PT, Terracciano A
Big Five personality - Openess to experience	de Moor MHM, Costa PT, Terracciano A
Alcohol dependence, case/control	Gelernter J, Kranzler HR, Sherva R, et a
Alcohol dependence, ordinal	Gelernter J, Kranzler HR, Sherva R, et a
Opiod dependence, ordinal	Gelernter J, Kranzler HR, Sherva R, et a
Cocaine dependence, ordinal	Gelernter J, Sherva R, Koesterer R, et a
Cigarettes per day	Tobacco and Genetics Consortium. Ger
Ever-smoked-status	Tobacco and Genetics Consortium. Ger
Neuroticism	Turley P, Walters RK, Maghizan O, et al
Attention defecit-hyperactivity disorder	Demontis D, Walters RK, Martin J, Matt
Alzheimer's disease	Lambert JC, Ibrahim-Verbaas CA, Harol
Anorexia nervosa	Duncan L., Yilmaz Z., Gaspar H., et al. Si

Anxiety-spectrum disorders, case/control	Otowa T, Hek K, Lee M, et al. Meta-ana
Anxiety-spectrum disorders, case/control	Otowa T, Hek K, Lee M, et al. Meta-ana
Autism	Anney RJL, Ripke S, Anttila V, Grove J, H
Bipolar disorder	Large-scale genome-wide association a
Bipolar disorder	Large-scale genome-wide association a
Bipolar disorder	Hou L, Bergen SE, Akula N, et al. Genon
Bipolar disorder	Hou L, Bergen SE, Akula N, et al. Genon
Major depressive disorder	Ripke S, Wray NR, Lewis CM, et al. A m
Obsessive compulsive disorder	PGC OCD/TS Working Group; Personal
Parkinson's Disease (Self-Report)	Pickrell, J. K., Berisa, T., Liu, J. Z., Ségure
Post-traumatic stress disorder	Duncan LE, Ratanatharathorn A, Aiello
Schizophrenia - European only	Anttila V, Bulik-Sullivan B, Finucane H,
Schizophrenia - European only	Anttila V, Bulik-Sullivan B, Finucane H,
Tourette syndrome	NA
Adolescent alcohol-related problems	Edwards AC, Aliev F, Wolen AR, et al. G
Childhood language impairment	Eicher JD, Powers NR, Miller LL, et al. G
Childhood reading disability.	Eicher JD, Powers NR, Miller LL, et al. G
Childhood combined reading disability and lan	Eicher JD, Powers NR, Miller LL, et al. G
Celiac disease	Dubois PCA, Trynka G, Franke L, et al. M
Crohn's disease	Franke A, McGovern DPB, Barrett JC, et
Crohn's disease	Franke A, McGovern DPB, Barrett JC, et
Crohn's disease	Liu, J. Z., van Sommeren, S., Huang, H.,
Crohn's disease	Liu, J. Z., van Sommeren, S., Huang, H.,
Ulcerative colitis	Anderson CA, Boucher G, Lees CW, et a
Ulcerative colitis	Anderson CA, Boucher G, Lees CW, et a
Ulcerative colitis	Liu, J. Z., van Sommeren, S., Huang, H.,
Ulcerative colitis	Liu, J. Z., van Sommeren, S., Huang, H.,
Eosinophilic esophagitis	Sleiman PMA, Wang M-L, Cianferoni A,

Web Link (for data downloads)	Quality Control (QC) + SNPs	Mean Association Chi-Squared of QC+ SNPs	Maximum Association Chi-Squared of QC+ SNPs
NA	1037762	1.0392	32.513
NA	959848	1.0038	21.489
NA	959854	1.0114	22.327
NA	959854	1.0037	22.548
NA	959854	1.0031	26.057
NA	968263	1.0303	24.577
NA	1065104	1.0835	35.223
NA	819917	1.029	38.092
http://plaza.umin.ac.jp/~yokada/(	1051805	1.1313	678.256
NA	494649	1.1473	174.048
NA	231820	1.0554	54.005
NA	854164	1.1791	358.513
23andme.com	1063433	1.3488	132.717
23andme.com	1063434	1.2681	309.715
NA	1056034	1.0809	99.532
23andme.org	1063434	1.1846	141.623
NA	965855	1.1763	397.913
23andme.com	1063434	1.1775	431.457
Immunobase.org	940715	1.1131	119.665
NA	1037355	1.0562	111.17
Immunobase.org	1056783	1.2235	293.251
NA	273542	1.0227	1060.517
NA	957682	1.0195	48.49
NA	853994	1.02	133.001
NA	479525	1.0215	25.42
NA	519294	1.208	31.73
www.tweelingenregister.org/GPC	771122	1.0095	20.04
www.tweelingenregister.org/GPC	771160	1.0294	29.753
www.tweelingenregister.org/GPC	771121	1.0165	24.859
www.tweelingenregister.org/GPC	771203	1.0233	20.73
www.tweelingenregister.org/GPC	771143	1.0373	30.849
NA	1058370	1.0623	109.183
NA	1058352	1.195	576.609
NA	1058352	1.1414	773.152
NA	1058352	1.1134	650.654
https://www.med.unc.edu/pgc/re	963495	1.0524	152.803
https://www.med.unc.edu/pgc/re	963355	1.1114	23.205
https://www.thessgac.org/data	1053712	1.3329	67.525
NA	1004958	1.3094	50.675
https://www.med.unc.edu/pgc/re	1037219	1.1185	565.218
http://www.med.unc.edu/pgc/file	1054719	1.083	31.789

https://www.med.unc.edu/pgc/re	974672	1.0303	31.867
https://www.med.unc.edu/pgc/re	1062352	1.025	35.434
https://www.med.unc.edu/pgc/re	59319	3.937	4.209
https://www.med.unc.edu/pgc/re	964863	1.1721	38.476
https://www.med.unc.edu/pgc/re	1061989	1.1657	38.476
http://www.nimh.nih.gov/hgb-dat	1052397	1.157	171.62
http://www.nimh.nih.gov/hgb-dat	1171775	1.1466	171.62
https://www.med.unc.edu/pgc/re	967534	1.0738	28.359
NA	1054746	1.0608	22.083
https://www.med.unc.edu/pgc/re	1063435	1.2072	244.863
AE, et al. Largest GWAS of PTSD (N	1062356	1.0144	21.769
https://www.med.unc.edu/pgc/re	1062106	1.7948	74.435
https://www.med.unc.edu/pgc/re	1123942	1.7976	120.758
NA	1041689	1.1129	27.989
NA	1047699	1.0048	24.417
NA	430923	1.0152	27.717
NA	430935	1.0002	20.777
NA	430932	1.0059	25.097
NA	271764	1.1505	100.937
http://www.ibdgenetics.org/dowr	812155	1.3878	308.793
http://www.ibdgenetics.org/dowr	870702	1.3824	308.793
http://www.ibdgenetics.org/dowr	1062075	1.2463	272.495
http://www.ibdgenetics.org/dowr	1066693	1.2444	272.495
http://www.ibdgenetics.org/dowr	1023135	1.3038	152.949
http://www.ibdgenetics.org/dowr	1141914	1.3019	219.203
http://www.ibdgenetics.org/dowr	1062094	1.1961	134.232
http://www.ibdgenetics.org/dowr	1092320	1.1953	186.328
NA	895928	1.051	22.595

Genome-Wide Significant Associated SNPs after QC	Genomic Inflation Factor (Lambda GC)	LD Score Regression Intercept (with Error)
1	1.0345	1.0259 (0.0063)
0	1.0195	0.9898 (0.0065)
0	1.0105	1.0099 (0.0071)
0	1.0016	1.0076 (0.0067)
0	1.0135	1.003 (0.0072)
0	1.0405	1.0087 (0.0074)
6	1.0802	1.0402 (0.0083)
1	1.0255	1.0101 (0.0082)
521	1.0466	0.9596 (0.0093)
37	1.1459	1.11 (0.0095)
2	1.0436	1.028 (0.0099)
251	1.1301	1.075 (0.0106)
581	1.2697	1.0439 (0.0102)
640	1.1779	1.0454 (0.0105)
124	1.0496	1.018 (0.0076)
159	1.1587	1.0061 (0.0091)
448	1.105	0.9974 (0.0095)
359	1.1144	1.0265 (0.0093)
288	1.0557	1.0089 (0.0096)
213	1.0345	0.9719 (0.0084)
298	1.1747	1.0917 (0.0114)
5	1.0195	1.0189 (0.009)
11	1.0165	1.0041 (0.0071)
8	1.0345	1.002 (0.0074)
0	1.0165	0.9838 (0.0083)
1	1.2103	1.2091 (0.0114)
0	0.9986	1.0021 (0.0099)
1	1.0195	1.0004 (0.0095)
0	1.0195	1.0001 (0.0092)
0	1.0255	1.0156 (0.0087)
2	1.0405	0.9885 (0.0094)
3	1.0772	1.0479 (0.0073)
640	1.1019	1.1035 (0.0076)
822	1.0375	1.038 (0.007)
669	1.0135	1.0257 (0.007)
63	1.0557	1.0046 (0.0065)
0	1.0926	1.005 (0.0069)
471	1.2531	0.996 (0.0104)
81	1.2631	1.0413 (0.0115)
159	1.0957	1.0316 (0.0082)
3	1.0802	1.006 (0.0074)

3	1.0345	1.0049 (0.0077)
14	1.0195	0.9987 (0.0066)
0	8.7142	3.8683 (0.0031)
17	1.1491	1.0225 (0.0085)
24	1.1459	1.0219 (0.0072)
34	1.1301	0.9916 (0.0077)
34	1.1207	0.984 (0.0065)
0	1.071	1.019 (0.0068)
0	1.0557	1.0027 (0.0079)
359	1.1459	1.0228 (0.0094)
0	1.0165	0.9985 (0.0069)
1287	1.607	1.0662 (0.0127)
1725	1.592	1.0571 (0.0117)
0	1.1113	1.0167 (0.0082)
0	1.0046	0.9981 (0.0073)
0	1.0075	1.0086 (0.007)
0	1.0016	0.9853 (0.0084)
0	1.0135	0.9957 (0.0079)
34	1.1175	1.0665 (0.0107)
915	1.2531	1.1654 (0.0142)
933	1.2531	1.1686 (0.0119)
997	1.1491	1.0424 (0.0114)
1009	1.1459	1.0313 (0.0114)
459	1.2431	1.1825 (0.0109)
641	1.2365	1.1775 (0.0087)
381	1.1333	1.0563 (0.01)
399	1.1333	1.0531 (0.0102)
0	1.0466	1.0265 (0.0083)

Ratio [(Intercept-1)/(mean(chi^2)-1)] measuring the proportion of the inflation in the mean chi-squared that the LD Score regression intercept ascribes to causes other than polygenic heritability.

Ratio: 0.6596 (0.1599)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.8641 (0.6204)
Ratio: 2.0719 (1.8092)
Ratio: 0.9607 (2.3205)
Ratio: 0.2875 (0.2431)
Ratio: 0.4817 (0.0989)
Ratio: 0.3498 (0.2838)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.7469 (0.0646)
Ratio: 0.5047 (0.1787)
Ratio: 0.419 (0.0594)
Ratio: 0.1259 (0.0292)
Ratio: 0.1694 (0.039)
Ratio: 0.2224 (0.0941)
Ratio: 0.0328 (0.0492)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.1493 (0.0525)
Ratio: 0.0784 (0.0849)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.4103 (0.0509)
Ratio: 0.8349 (0.3969)
Ratio: 0.2094 (0.3633)
Ratio: 0.0994 (0.3694)
Ratio < 0 (usually indicates GC correction).
Ratio: 1.0052 (0.0546)
Ratio: 0.2229 (1.0408)
Ratio: 0.0125 (0.3226)
Ratio: 0.0042 (0.56)
Ratio: 0.6721 (0.3761)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.7698 (0.1174)
Ratio: 0.5308 (0.0392)
Ratio: 0.2686 (0.0495)
Ratio: 0.2268 (0.0614)
Ratio: 0.0882 (0.124)
Ratio: 0.0447 (0.0619)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.1336 (0.0372)
Ratio: 0.2671 (0.0693)
Ratio: 0.0717 (0.0896)

Ratio: 0.1631 (0.2535)
Ratio < 0 (usually indicates GC correction).
Intercept: 3.8683 (0.0031)
Ratio: 0.1307 (0.0496)
Ratio: 0.1323 (0.0437)
Ratio < 0 (usually indicates GC correction).
Ratio < 0 (usually indicates GC correction).
Ratio: 0.2574 (0.0924)
Ratio: 0.0452 (0.1298)
Ratio: 0.1102 (0.0453)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.0833 (0.016)
Ratio: 0.0716 (0.0146)
Ratio: 0.1477 (0.0724)
Ratio < 0 (usually indicates GC correction).
Ratio: 0.5699 (0.4633)
Ratio < 0 (usually indicates GC correction).
Ratio < 0 (usually indicates GC correction).
Ratio: 0.4415 (0.0709)
Ratio: 0.4266 (0.0367)
Ratio: 0.4409 (0.0311)
Ratio: 0.1721 (0.0463)
Ratio: 0.1281 (0.0468)
Ratio: 0.6007 (0.0358)
Ratio: 0.5879 (0.0288)
Ratio: 0.2869 (0.0509)
Ratio: 0.2722 (0.0521)
Ratio: 0.5199 (0.1631)

*Note: p-values < 0.05 (before and after correction) are highlighted in red.

Phenotype 1 Code	Phenotype 2 Code
14c_i_tb.sumstats	3_b_psy_parkinson.sumstats
14c_i_tb.sumstats	36_b_anger_temp.sumstats
14c_i_tb.sumstats	37_b_sub_cigperday.sumstats
14c_i_tb.sumstats	37_b_sub_evrsmk.sumstats
14c_i_tb.sumstats	38_b_neuroticism.sumstats
14c_i_tb.sumstats	39_b_psy_adhd.sumstats
14c_i_tb.sumstats	39_b_psy_alz.sumstats
14c_i_tb.sumstats	39_b_psy_anor.sumstats
14c_i_tb.sumstats	39_b_psy_bipolar_05.sumstats
14c_i_tb.sumstats	39_b_psy_bipolar_info9.sumstats
14c_i_tb.sumstats	39_b_psy_mddprimary_nomhc.sumstats
14c_i_tb.sumstats	39_b_psy_ocd.sumstats
14c_i_tb.sumstats	39_b_psy_sz_eur_05.sumstats
14c_i_tb.sumstats	39_b_psy_sz_eur_info9.sumstats
14c_i_tb.sumstats	39_b_psy_td.sumstats
22_i_RA_okada.sumstats	3_b_psy_parkinson.sumstats
22_i_RA_okada.sumstats	36_b_anger_temp.sumstats
22_i_RA_okada.sumstats	37_b_sub_cigperday.sumstats
22_i_RA_okada.sumstats	37_b_sub_evrsmk.sumstats
22_i_RA_okada.sumstats	38_b_neuroticism.sumstats
22_i_RA_okada.sumstats	39_b_psy_adhd.sumstats
22_i_RA_okada.sumstats	39_b_psy_alz.sumstats
22_i_RA_okada.sumstats	39_b_psy_anor.sumstats
22_i_RA_okada.sumstats	39_b_psy_asd.sumstats
22_i_RA_okada.sumstats	39_b_psy_bipolar_05.sumstats
22_i_RA_okada.sumstats	39_b_psy_bipolar_info9.sumstats
22_i_RA_okada.sumstats	39_b_psy_mddprimary_nomhc.sumstats
22_i_RA_okada.sumstats	39_b_psy_ocd.sumstats
22_i_RA_okada.sumstats	39_b_psy_sz_eur_05.sumstats
22_i_RA_okada.sumstats	39_b_psy_sz_eur_info9.sumstats
22_i_RA_okada.sumstats	39_b_psy_td.sumstats
28_i_t1d.sumstats	3_b_psy_parkinson.sumstats
28_i_t1d.sumstats	36_b_anger_temp.sumstats
28_i_t1d.sumstats	37_b_sub_cigperday.sumstats
28_i_t1d.sumstats	37_b_sub_evrsmk.sumstats
28_i_t1d.sumstats	38_b_neuroticism.sumstats
28_i_t1d.sumstats	39_b_psy_adhd.sumstats
28_i_t1d.sumstats	39_b_psy_alz.sumstats
28_i_t1d.sumstats	39_b_psy_anor.sumstats
28_i_t1d.sumstats	39_b_psy_bipolar_05.sumstats
28_i_t1d.sumstats	39_b_psy_bipolar_info9.sumstats

28_i_t1d.sumstats	39_b_psy_mddprimary_nomhc.sumstats
28_i_t1d.sumstats	39_b_psy_ocd.sumstats
28_i_t1d.sumstats	39_b_psy_sz_eur_05.sumstats
28_i_t1d.sumstats	39_b_psy_sz_eur_info9.sumstats
28_i_t1d.sumstats	39_b_psy_td.sumstats
3_i_allergyany.sumstats	3_b_psy_parkinson.sumstats
3_i_allergyany.sumstats	36_b_anger_temp.sumstats
3_i_allergyany.sumstats	37_b_sub_cigperday.sumstats
3_i_allergyany.sumstats	37_b_sub_evrsmk.sumstats
3_i_allergyany.sumstats	38_b_neuroticism.sumstats
3_i_allergyany.sumstats	39_b_psy_adhd.sumstats
3_i_allergyany.sumstats	39_b_psy_alz.sumstats
3_i_allergyany.sumstats	39_b_psy_anor.sumstats
3_i_allergyany.sumstats	39_b_psy_asd.sumstats
3_i_allergyany.sumstats	39_b_psy_bipolar_05.sumstats
3_i_allergyany.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_allergyany.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_allergyany.sumstats	39_b_psy_ocd.sumstats
3_i_allergyany.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_allergyany.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_allergyany.sumstats	39_b_psy_td.sumstats
3_i_asthma.sumstats	3_b_psy_parkinson.sumstats
3_i_asthma.sumstats	36_b_anger_temp.sumstats
3_i_asthma.sumstats	37_b_sub_cigperday.sumstats
3_i_asthma.sumstats	37_b_sub_evrsmk.sumstats
3_i_asthma.sumstats	38_b_neuroticism.sumstats
3_i_asthma.sumstats	39_b_psy_adhd.sumstats
3_i_asthma.sumstats	39_b_psy_alz.sumstats
3_i_asthma.sumstats	39_b_psy_anor.sumstats
3_i_asthma.sumstats	39_b_psy_asd.sumstats
3_i_asthma.sumstats	39_b_psy_bipolar_05.sumstats
3_i_asthma.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_asthma.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_asthma.sumstats	39_b_psy_ocd.sumstats
3_i_asthma.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_asthma.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_asthma.sumstats	39_b_psy_td.sumstats
3_i_atopicdermatitis.sumstats	3_b_psy_parkinson.sumstats
3_i_atopicdermatitis.sumstats	36_b_anger_temp.sumstats
3_i_atopicdermatitis.sumstats	37_b_sub_cigperday.sumstats
3_i_atopicdermatitis.sumstats	37_b_sub_evrsmk.sumstats
3_i_atopicdermatitis.sumstats	38_b_neuroticism.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_adhd.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_alz.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_anor.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_asd.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_bipolar_05.sumstats

3_i_atopicdermatitis.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_ocd.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_atopicdermatitis.sumstats	39_b_psy_td.sumstats
3_i_childhoodear.sumstats	3_b_psy_parkinson.sumstats
3_i_childhoodear.sumstats	36_b_anger_temp.sumstats
3_i_childhoodear.sumstats	37_b_sub_cigperday.sumstats
3_i_childhoodear.sumstats	37_b_sub_evrsmk.sumstats
3_i_childhoodear.sumstats	38_b_neuroticism.sumstats
3_i_childhoodear.sumstats	39_b_psy_adhd.sumstats
3_i_childhoodear.sumstats	39_b_psy_alz.sumstats
3_i_childhoodear.sumstats	39_b_psy_anor.sumstats
3_i_childhoodear.sumstats	39_b_psy_asd.sumstats
3_i_childhoodear.sumstats	39_b_psy_bipolar_05.sumstats
3_i_childhoodear.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_childhoodear.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_childhoodear.sumstats	39_b_psy_ocd.sumstats
3_i_childhoodear.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_childhoodear.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_childhoodear.sumstats	39_b_psy_td.sumstats
3_i_crp.sumstats	3_b_psy_parkinson.sumstats
3_i_crp.sumstats	36_b_anger_temp.sumstats
3_i_crp.sumstats	37_b_sub_cigperday.sumstats
3_i_crp.sumstats	37_b_sub_evrsmk.sumstats
3_i_crp.sumstats	38_b_neuroticism.sumstats
3_i_crp.sumstats	39_b_psy_adhd.sumstats
3_i_crp.sumstats	39_b_psy_alz.sumstats
3_i_crp.sumstats	39_b_psy_anor.sumstats
3_i_crp.sumstats	39_b_psy_asd.sumstats
3_i_crp.sumstats	39_b_psy_bipolar_05.sumstats
3_i_crp.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_crp.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_crp.sumstats	39_b_psy_ocd.sumstats
3_i_crp.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_crp.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_crp.sumstats	39_b_psy_td.sumstats
3_i_hypothyroid.sumstats	3_b_psy_parkinson.sumstats
3_i_hypothyroid.sumstats	36_b_anger_temp.sumstats
3_i_hypothyroid.sumstats	37_b_sub_cigperday.sumstats
3_i_hypothyroid.sumstats	37_b_sub_evrsmk.sumstats
3_i_hypothyroid.sumstats	38_b_neuroticism.sumstats
3_i_hypothyroid.sumstats	39_b_psy_adhd.sumstats
3_i_hypothyroid.sumstats	39_b_psy_alz.sumstats
3_i_hypothyroid.sumstats	39_b_psy_anor.sumstats
3_i_hypothyroid.sumstats	39_b_psy_asd.sumstats

3_i_hypothyroid.sumstats	39_b_psy_bipolar_05.sumstats
3_i_hypothyroid.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_hypothyroid.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_hypothyroid.sumstats	39_b_psy_ocd.sumstats
3_i_hypothyroid.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_hypothyroid.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_hypothyroid.sumstats	39_b_psy_td.sumstats
3_i_pbc.sumstats	3_b_psy_parkinson.sumstats
3_i_pbc.sumstats	36_b_anger_temp.sumstats
3_i_pbc.sumstats	37_b_sub_cigperday.sumstats
3_i_pbc.sumstats	37_b_sub_evrsmk.sumstats
3_i_pbc.sumstats	38_b_neuroticism.sumstats
3_i_pbc.sumstats	39_b_psy_adhd.sumstats
3_i_pbc.sumstats	39_b_psy_alz.sumstats
3_i_pbc.sumstats	39_b_psy_anor.sumstats
3_i_pbc.sumstats	39_b_psy_asd.sumstats
3_i_pbc.sumstats	39_b_psy_bipolar_05.sumstats
3_i_pbc.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_pbc.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_pbc.sumstats	39_b_psy_ocd.sumstats
3_i_pbc.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_pbc.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_pbc.sumstats	39_b_psy_td.sumstats
3_i_psoriasis.sumstats	3_b_psy_parkinson.sumstats
3_i_psoriasis.sumstats	36_b_anger_temp.sumstats
3_i_psoriasis.sumstats	37_b_sub_cigperday.sumstats
3_i_psoriasis.sumstats	37_b_sub_evrsmk.sumstats
3_i_psoriasis.sumstats	38_b_neuroticism.sumstats
3_i_psoriasis.sumstats	39_b_psy_adhd.sumstats
3_i_psoriasis.sumstats	39_b_psy_alz.sumstats
3_i_psoriasis.sumstats	39_b_psy_anor.sumstats
3_i_psoriasis.sumstats	39_b_psy_asd.sumstats
3_i_psoriasis.sumstats	39_b_psy_bipolar_05.sumstats
3_i_psoriasis.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_psoriasis.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_psoriasis.sumstats	39_b_psy_ocd.sumstats
3_i_psoriasis.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_psoriasis.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_psoriasis.sumstats	39_b_psy_td.sumstats
3_i_sle.sumstats	3_b_psy_parkinson.sumstats
3_i_sle.sumstats	36_b_anger_temp.sumstats
3_i_sle.sumstats	37_b_sub_cigperday.sumstats
3_i_sle.sumstats	37_b_sub_evrsmk.sumstats
3_i_sle.sumstats	38_b_neuroticism.sumstats
3_i_sle.sumstats	39_b_psy_adhd.sumstats
3_i_sle.sumstats	39_b_psy_alz.sumstats
3_i_sle.sumstats	39_b_psy_anor.sumstats

3_i_sle.sumstats	39_b_psy_bipolar_05.sumstats
3_i_sle.sumstats	39_b_psy_bipolar_info9.sumstats
3_i_sle.sumstats	39_b_psy_mddprimary_nomhc.sumstats
3_i_sle.sumstats	39_b_psy_ocd.sumstats
3_i_sle.sumstats	39_b_psy_sz_eur_05.sumstats
3_i_sle.sumstats	39_b_psy_sz_eur_info9.sumstats
3_i_sle.sumstats	39_b_psy_td.sumstats
5_i_celiac.sumstats	3_b_psy_parkinson.sumstats
5_i_celiac.sumstats	36_b_anger_temp.sumstats
5_i_celiac.sumstats	37_b_sub_cigperday.sumstats
5_i_celiac.sumstats	37_b_sub_evrsmk.sumstats
5_i_celiac.sumstats	38_b_neuroticism.sumstats
5_i_celiac.sumstats	39_b_psy_adhd.sumstats
5_i_celiac.sumstats	39_b_psy_alz.sumstats
5_i_celiac.sumstats	39_b_psy_anor.sumstats
5_i_celiac.sumstats	39_b_psy_asd.sumstats
5_i_celiac.sumstats	39_b_psy_bipolar_05.sumstats
5_i_celiac.sumstats	39_b_psy_bipolar_info9.sumstats
5_i_celiac.sumstats	39_b_psy_mddprimary_nomhc.sumstats
5_i_celiac.sumstats	39_b_psy_ocd.sumstats
5_i_celiac.sumstats	39_b_psy_sz_eur_05.sumstats
5_i_celiac.sumstats	39_b_psy_sz_eur_info9.sumstats
5_i_celiac.sumstats	39_b_psy_td.sumstats
6_i_crohns_franke_05.sumstats	3_b_psy_parkinson.sumstats
6_i_crohns_franke_05.sumstats	36_b_anger_temp.sumstats
6_i_crohns_franke_05.sumstats	37_b_sub_cigperday.sumstats
6_i_crohns_franke_05.sumstats	37_b_sub_evrsmk.sumstats
6_i_crohns_franke_05.sumstats	38_b_neuroticism.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_adhd.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_alz.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_anor.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_asd.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_bipolar_05.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_bipolar_info9.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_mddprimary_nomhc.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_ocd.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_sz_eur_05.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_sz_eur_info9.sumstats
6_i_crohns_franke_05.sumstats	39_b_psy_td.sumstats
6_i_crohns_franke_all.sumstats	3_b_psy_parkinson.sumstats
6_i_crohns_franke_all.sumstats	36_b_anger_temp.sumstats
6_i_crohns_franke_all.sumstats	37_b_sub_cigperday.sumstats
6_i_crohns_franke_all.sumstats	37_b_sub_evrsmk.sumstats
6_i_crohns_franke_all.sumstats	38_b_neuroticism.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_adhd.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_alz.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_anor.sumstats

6_i_crohns_franke_all.sumstats	39_b_psy_asd.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_bipolar_05.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_bipolar_info9.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_mddprimary_nomhc.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_ocd.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_sz_eur_05.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_sz_eur_info9.sumstats
6_i_crohns_franke_all.sumstats	39_b_psy_td.sumstats
6_i_crohns_liu_05.sumstats	3_b_psy_parkinson.sumstats
6_i_crohns_liu_05.sumstats	36_b_anger_temp.sumstats
6_i_crohns_liu_05.sumstats	37_b_sub_cigperday.sumstats
6_i_crohns_liu_05.sumstats	37_b_sub_evrsmk.sumstats
6_i_crohns_liu_05.sumstats	38_b_neuroticism.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_adhd.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_alz.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_anor.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_asd.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_bipolar_05.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_bipolar_info9.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_mddprimary_nomhc.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_ocd.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_sz_eur_05.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_sz_eur_info9.sumstats
6_i_crohns_liu_05.sumstats	39_b_psy_td.sumstats
6_i_crohns_liu_info9.sumstats	3_b_psy_parkinson.sumstats
6_i_crohns_liu_info9.sumstats	36_b_anger_temp.sumstats
6_i_crohns_liu_info9.sumstats	37_b_sub_cigperday.sumstats
6_i_crohns_liu_info9.sumstats	37_b_sub_evrsmk.sumstats
6_i_crohns_liu_info9.sumstats	38_b_neuroticism.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_adhd.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_alz.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_anor.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_asd.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_bipolar_05.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_bipolar_info9.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_mddprimary_nomhc.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_ocd.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_sz_eur_05.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_sz_eur_info9.sumstats
6_i_crohns_liu_info9.sumstats	39_b_psy_td.sumstats
7_i_uc_andersen_05.sumstats	3_b_psy_parkinson.sumstats
7_i_uc_andersen_05.sumstats	36_b_anger_temp.sumstats
7_i_uc_andersen_05.sumstats	37_b_sub_cigperday.sumstats
7_i_uc_andersen_05.sumstats	37_b_sub_evrsmk.sumstats
7_i_uc_andersen_05.sumstats	38_b_neuroticism.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_adhd.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_alz.sumstats

7_i_uc_andersen_05.sumstats	39_b_psy_anor.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_asd.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_bipolar_05.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_bipolar_info9.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_mddprimary_nomhc.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_ocd.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_sz_eur_05.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_sz_eur_info9.sumstats
7_i_uc_andersen_05.sumstats	39_b_psy_td.sumstats
7_i_uc_andersen_all.sumstats	3_b_psy_parkinson.sumstats
7_i_uc_andersen_all.sumstats	36_b_anger_temp.sumstats
7_i_uc_andersen_all.sumstats	37_b_sub_cigperday.sumstats
7_i_uc_andersen_all.sumstats	37_b_sub_evrsmk.sumstats
7_i_uc_andersen_all.sumstats	38_b_neuroticism.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_adhd.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_alz.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_anor.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_asd.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_bipolar_05.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_bipolar_info9.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_mddprimary_nomhc.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_ocd.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_sz_eur_05.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_sz_eur_info9.sumstats
7_i_uc_andersen_all.sumstats	39_b_psy_td.sumstats
7_i_uc_liu_05.sumstats	3_b_psy_parkinson.sumstats
7_i_uc_liu_05.sumstats	36_b_anger_temp.sumstats
7_i_uc_liu_05.sumstats	37_b_sub_cigperday.sumstats
7_i_uc_liu_05.sumstats	37_b_sub_evrsmk.sumstats
7_i_uc_liu_05.sumstats	38_b_neuroticism.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_adhd.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_alz.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_anor.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_asd.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_bipolar_05.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_bipolar_info9.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_mddprimary_nomhc.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_ocd.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_sz_eur_05.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_sz_eur_info9.sumstats
7_i_uc_liu_05.sumstats	39_b_psy_td.sumstats
7_i_uc_liu_info9.sumstats	3_b_psy_parkinson.sumstats
7_i_uc_liu_info9.sumstats	36_b_anger_temp.sumstats
7_i_uc_liu_info9.sumstats	37_b_sub_cigperday.sumstats
7_i_uc_liu_info9.sumstats	37_b_sub_evrsmk.sumstats
7_i_uc_liu_info9.sumstats	38_b_neuroticism.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_adhd.sumstats

7_i_uc_liu_info9.sumstats	39_b_psy_alz.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_anor.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_asd.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_bipolar_05.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_bipolar_info9.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_mddprimary_nomhc.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_ocd.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_sz_eur_05.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_sz_eur_info9.sumstats
7_i_uc_liu_info9.sumstats	39_b_psy_td.sumstats

Genetic Correlation Coefficient	Estimated Error of Genetic Correlation Coefficient	Genetic Correlation Uncorrected *P*-Value*	Genetic Correlation *P*-Value After Benjamini-Hochberg Correction*	Genetic Correlation *P*-Value After Bonferroni Correction*
0.0307	0.1001	0.7592	0.934095273	1
0.2011	0.1968	0.3069	0.604720118	1
0.5079	0.1877	0.0068	0.058061538	1
0.2835	0.1335	0.0337	0.145122222	1
0.158	0.0775	0.0414	0.164121429	1
0.3597	0.114	0.0016	0.020492308	0.5328
0.0989	0.1586	0.533	0.806768182	1
-0.0389	0.1593	0.8069	0.951981338	1
-0.0614	0.124	0.6206	0.876056962	1
-0.0902	0.1071	0.3997	0.702089529	1
0.0692	0.1583	0.6618	0.89991551	1
-0.0405	0.1658	0.8069	0.951981338	1
0.1949	0.0741	0.0086	0.06174375	1
0.1519	0.0819	0.0636	0.225306383	1
0.1295	0.139	0.3514	0.653721788	1
-0.0446	0.0472	0.3443	0.644111798	1
-0.0151	0.0986	0.8784	0.976448734	1
0.134	0.0824	0.1038	0.3114	1
0.1662	0.0546	0.0023	0.026410345	0.7659
-0.0332	0.0462	0.4727	0.766546602	1
0.1568	0.047	9.00E-04	0.013622727	0.2997
-0.1268	0.098	0.1956	0.44325	1
-0.1252	0.0709	0.0773	0.247508654	1
-0.2522	0.3429	0.462	0.766546602	1
-0.1496	0.0698	0.0322	0.142968	1
-0.1496	0.0698	0.0322	0.142968	1
-0.0698	0.0834	0.4027	0.702089529	1
-0.1623	0.0727	0.0255	0.121307143	1
-0.01	0.0323	0.7559	0.934095273	1
-0.0301	0.0339	0.3741	0.680739344	1
0.0845	0.0653	0.1959	0.44325	1
0.0873	0.0653	0.181	0.439948905	1
0.1098	0.1693	0.5166	0.803868224	1
0.0642	0.1261	0.6109	0.876056962	1
-0.0433	0.0822	0.5986	0.866668696	1
-0.0287	0.0921	0.7554	0.934095273	1
-0.1413	0.0653	0.0306	0.139586301	1
-0.0814	0.1137	0.4742	0.766546602	1
0.0476	0.101	0.6373	0.880584647	1
-0.065	0.0681	0.3396	0.638908475	1
-0.065	0.0681	0.3396	0.638908475	1

-0.0884	0.1165	0.4481	0.749835678	1
-0.317	0.114	0.0054	0.0486	1
-0.0162	0.0501	0.7467	0.934095273	1
-0.0108	0.0468	0.8181	0.952543007	1
-0.0465	0.0832	0.576	0.83758952	1
-0.0595	0.0437	0.1733	0.433901504	1
0.0269	0.0943	0.7752	0.935295652	1
0.0435	0.072	0.5456	0.8184	1
-0.0102	0.0536	0.8497	0.964793878	1
0.0871	0.0328	0.0078	0.059031818	1
0.1146	0.0422	0.0067	0.058061538	1
-0.1832	0.0863	0.0339	0.145122222	1
-0.0951	0.0631	0.1318	0.365745	1
0.7513	0.3339	0.0244	0.117756522	1
-0.1125	0.047	0.0167	0.095881034	1
-0.1163	0.0461	0.0116	0.074925	1
0.0941	0.0676	0.1635	0.418811538	1
-0.0826	0.074	0.2643	0.557037342	1
0.0234	0.0298	0.4314	0.734978571	1
0.0287	0.0347	0.4088	0.7090125	1
0.2382	0.0567	2.66E-05	0.003116714	0.008855469
-0.0867	0.0517	0.0937	0.284563636	1
0.1654	0.0929	0.075	0.247277228	1
-0.0563	0.0718	0.4326	0.734978571	1
0.0051	0.055	0.9256	0.976448734	1
0.0995	0.0471	0.0348	0.145122222	1
0.1198	0.0473	0.0114	0.074925	1
-0.068	0.0845	0.4215	0.727251295	1
0.0709	0.0569	0.2128	0.472416	1
-0.0136	0.3777	0.9713	0.9888	1
0.0051	0.0539	0.9243	0.976448734	1
0.0011	0.0535	0.9839	0.9888	1
0.1491	0.0798	0.0617	0.224051087	1
0.015	0.0699	0.8297	0.95574433	1
0.0577	0.0317	0.0688	0.236837755	1
0.0449	0.0348	0.197	0.44325	1
0.121	0.065	0.0628	0.224864516	1
-0.0436	0.0839	0.6033	0.869692208	1
0.0197	0.1726	0.909	0.976448734	1
0.251	0.1659	0.1302	0.365745	1
-0.0168	0.0899	0.8518	0.964793878	1
0.0457	0.077	0.5529	0.823768	1
0.0934	0.0749	0.2124	0.472416	1
0.106	0.1393	0.4467	0.749835678	1
0.1316	0.1013	0.1943	0.44325	1
0.1263	0.4559	0.7817	0.939733213	1
0.0388	0.0887	0.6621	0.89991551	1

0.0388	0.0887	0.6621	0.89991551	1
0.0357	0.1345	0.7904	0.943380645	1
-0.0054	0.1215	0.9648	0.9888	1
0.0349	0.052	0.5028	0.789775472	1
0.0396	0.0575	0.491	0.782311005	1
-0.0777	0.1073	0.4689	0.766546602	1
-0.0063	0.0506	0.9004	0.976448734	1
0.2462	0.1049	0.0189	0.104895	1
0.0114	0.0861	0.8949	0.976448734	1
0.1083	0.0628	0.0844	0.265143396	1
0.1329	0.0395	8.00E-04	0.012685714	0.2664
0.2008	0.0538	2.00E-04	0.0041625	0.0666
-0.0949	0.0896	0.2894	0.583753012	1
0.0925	0.0758	0.2222	0.484264706	1
0.1663	0.3352	0.6198	0.876056962	1
0.0964	0.0539	0.0738	0.245754	1
0.1007	0.0507	0.0471	0.184521176	1
0.1679	0.0792	0.0341	0.145122222	1
0.0274	0.0861	0.75	0.934095273	1
0.0423	0.0358	0.2371	0.51269026	1
0.0553	0.036	0.1241	0.359350435	1
-0.0037	0.071	0.9583	0.9888	1
-0.0594	0.054	0.2719	0.559522222	1
0.12	0.1093	0.2722	0.559522222	1
0.3702	0.0912	4.95E-05	0.003295235	0.016476174
0.3069	0.0743	3.58E-05	0.003116714	0.011907414
-0.0295	0.0597	0.6211	0.876056962	1
0.232	0.0626	2.00E-04	0.0041625	0.0666
0.055	0.1177	0.6403	0.881073967	1
-0.2954	0.0777	1.00E-04	0.0041625	0.0333
0.5026	0.4985	0.3134	0.613895294	1
0.0087	0.0554	0.8753	0.976448734	1
0.0087	0.0554	0.8753	0.976448734	1
0.2114	0.0964	0.0283	0.1308875	1
-0.1839	0.0817	0.0244	0.117756522	1
-0.0491	0.0372	0.1872	0.44325	1
-0.0429	0.0433	0.322	0.627052632	1
0.0265	0.0711	0.7099	0.923424609	1
-0.0864	0.0581	0.1368	0.376482645	1
0.0219	0.105	0.8352	0.95574433	1
0.0529	0.0725	0.4656	0.766546602	1
0.126	0.0616	0.0409	0.164092771	1
0.2475	0.0624	7.23E-05	0.004013594	0.024081561
0.1484	0.0598	0.0131	0.07992	1
-0.109	0.1031	0.2907	0.583753012	1
-0.0222	0.0814	0.7853	0.940665108	1
0.0386	0.4744	0.9351	0.982297476	1

0.1128	0.0617	0.0676	0.236837755	1
0.105	0.0587	0.0736	0.245754	1
0.3312	0.0944	5.00E-04	0.008325	0.1665
-0.1378	0.0903	0.1271	0.364864655	1
0.0745	0.0421	0.0768	0.247508654	1
0.0567	0.0458	0.216	0.476344371	1
0.0845	0.0738	0.2519	0.534284713	1
0.0386	0.0688	0.5748	0.83758952	1
-0.0588	0.1404	0.6755	0.903379518	1
0.1384	0.1135	0.2225	0.484264706	1
0.1014	0.0784	0.1954	0.44325	1
0.0218	0.0746	0.7697	0.934095273	1
0.0706	0.0668	0.291	0.583753012	1
-0.2064	0.1415	0.1445	0.388052419	1
-0.0592	0.0938	0.5281	0.806684862	1
0.4764	0.5227	0.3621	0.669885	1
0.1931	0.0721	0.0074	0.058671429	1
0.1931	0.0721	0.0074	0.058671429	1
-0.023	0.123	0.8518	0.964793878	1
0.1549	0.1111	0.163	0.418811538	1
0.1409	0.0457	0.002	0.024666667	0.666
0.1317	0.0488	0.007	0.058275	1
0.0848	0.0864	0.3264	0.631925581	1
-0.0941	0.0707	0.1831	0.441828261	1
-0.0495	0.1509	0.7431	0.934095273	1
0.2059	0.1229	0.094	0.284563636	1
0.0953	0.0868	0.2719	0.559522222	1
-8.00E-04	0.0537	0.9888	0.9888	1
0.2325	0.0707	0.001	0.013875	0.333
-0.0153	0.1224	0.9006	0.976448734	1
-0.0546	0.0895	0.5417	0.816226697	1
0.2397	0.3826	0.5309	0.806768182	1
0.2446	0.0845	0.0038	0.03954375	1
0.2446	0.0845	0.0038	0.03954375	1
0.011	0.119	0.9266	0.976448734	1
0.0185	0.1173	0.8748	0.976448734	1
0.0987	0.0422	0.0193	0.105359016	1
0.0876	0.0462	0.058	0.21497	1
0.2529	0.0954	0.008	0.0592	1
-0.0572	0.0636	0.3682	0.67740663	1
-0.0157	0.1369	0.9085	0.976448734	1
0.0225	0.0916	0.8058	0.951981338	1
0.0973	0.0721	0.1774	0.438776471	1
-0.0341	0.1172	0.7714	0.934095273	1
0.0459	0.0538	0.393	0.702089529	1
0.0069	0.1064	0.9487	0.987240938	1
0.0137	0.091	0.88	0.976448734	1

0.0591	0.0619	0.3396	0.638908475	1
0.0591	0.0619	0.3396	0.638908475	1
0.0816	0.1226	0.5055	0.790288732	1
-0.0437	0.0925	0.6366	0.880584647	1
0.1464	0.0451	0.0012	0.015984	0.3996
0.1433	0.0468	0.0022	0.026164286	0.7326
0.1173	0.0759	0.1223	0.357244737	1
0.1295	0.0814	0.1114	0.331216071	1
-0.0903	0.184	0.6235	0.876056962	1
0.0404	0.1281	0.7521	0.934095273	1
-0.0878	0.1026	0.3922	0.702089529	1
0.0032	0.0693	0.9631	0.9888	1
-0.1297	0.0765	0.0898	0.279471028	1
0.0161	0.1575	0.9187	0.976448734	1
0.0064	0.0911	0.9436	0.985011912	1
-0.348	0.9782	0.722	0.926252308	1
0.3068	0.0871	4.00E-04	0.0074	0.1332
0.3068	0.0871	4.00E-04	0.0074	0.1332
0.2019	0.1369	0.1403	0.381190244	1
0.4303	0.1727	0.0127	0.07979434	1
0.0987	0.0556	0.0759	0.247508654	1
0.1403	0.0557	0.0117	0.074925	1
0.0153	0.1013	0.8802	0.976448734	1
-0.0268	0.0639	0.6743	0.903379518	1
-0.1618	0.1116	0.1469	0.388235714	1
0.1241	0.0945	0.189	0.44325	1
-0.0392	0.0697	0.5735	0.83758952	1
0.019	0.0448	0.6718	0.903379518	1
0.0055	0.0483	0.9086	0.976448734	1
-0.0609	0.0964	0.5276	0.806684862	1
-0.0015	0.0726	0.9831	0.9888	1
0.4706	0.5616	0.402	0.702089529	1
0.1384	0.0599	0.0209	0.108745313	1
0.1384	0.0599	0.0209	0.108745313	1
-0.0499	0.0849	0.5566	0.823768	1
0.0319	0.0924	0.73	0.927824427	1
0.09	0.0393	0.0219	0.110495455	1
0.0813	0.0389	0.0366	0.148631707	1
-0.0015	0.0703	0.9835	0.9888	1
-0.0291	0.0593	0.6231	0.876056962	1
-0.1618	0.1116	0.1469	0.388235714	1
0.1241	0.0945	0.189	0.44325	1
-0.0392	0.0697	0.5735	0.83758952	1
0.019	0.0448	0.6718	0.903379518	1
0.0055	0.0483	0.9086	0.976448734	1
-0.0609	0.0964	0.5276	0.806684862	1
-0.0015	0.0726	0.9831	0.9888	1

0.4706	0.5616	0.402	0.702089529	1
0.1384	0.0599	0.0209	0.108745313	1
0.1484	0.0567	0.0089	0.06174375	1
-0.0499	0.0849	0.5566	0.823768	1
0.0319	0.0924	0.73	0.927824427	1
0.09	0.0393	0.0219	0.110495455	1
0.0841	0.0383	0.0282	0.1308875	1
-0.0015	0.0703	0.9835	0.9888	1
-0.0212	0.0549	0.6991	0.919471765	1
-0.1194	0.103	0.2467	0.530007097	1
0.1912	0.0837	0.0224	0.111331343	1
-0.0209	0.0576	0.7161	0.924268605	1
0.0275	0.0402	0.494	0.783342857	1
0.0293	0.0456	0.5215	0.806684862	1
-0.0885	0.0916	0.3337	0.638908475	1
-0.0517	0.0723	0.474	0.766546602	1
-0.0261	0.3459	0.9398	0.984130189	1
0.2079	0.0504	3.74E-05	0.003116714	0.012466854
0.2079	0.0504	3.74E-05	0.003116714	0.012466854
-0.0082	0.0731	0.911	0.976448734	1
0.0643	0.0838	0.4423	0.747644162	1
0.1221	0.0326	2.00E-04	0.0041625	0.0666
0.104	0.0361	0.004	0.040363636	1
0.032	0.0673	0.6344	0.880584647	1
-0.0274	0.058	0.637	0.880584647	1
-0.1545	0.1049	0.1408	0.381190244	1
0.187	0.0987	0.0581	0.21497	1
-0.0593	0.0701	0.3978	0.702089529	1
-0.0013	0.0437	0.9757	0.9888	1
0.0339	0.0502	0.499	0.787521327	1
-0.1218	0.0863	0.1578	0.410526563	1
-0.0868	0.0754	0.2491	0.531732692	1
0.0579	0.5518	0.9164	0.976448734	1
0.1518	0.0581	0.0089	0.06174375	1
0.1564	0.0515	0.0024	0.02664	0.7992
-0.0625	0.0783	0.4248	0.72916701	1
0.0616	0.0887	0.487	0.780308654	1
0.1072	0.0402	0.0076	0.058855814	1
0.0977	0.0343	0.0045	0.044073529	1
0.0159	0.0748	0.8313	0.95574433	1
-0.0506	0.0729	0.4874	0.780308654	1
-0.1285	0.1234	0.2979	0.590480357	1
0.0312	0.1048	0.7656	0.934095273	1
-0.0097	0.0789	0.9016	0.976448734	1
0.1136	0.0627	0.0697	0.236837755	1
-0.0208	0.053	0.6954	0.918921429	1
-0.1439	0.1111	0.1954	0.44325	1

0.1855	0.0956	0.0523	0.197907955	1
-0.1571	0.66	0.8119	0.951981338	1
0.2476	0.0659	2.00E-04	0.0041625	0.0666
0.2476	0.0659	2.00E-04	0.0041625	0.0666
0.1602	0.1193	0.1792	0.438776471	1
0.2666	0.0951	0.005	0.04625	1
0.1072	0.0436	0.0141	0.082373684	1
0.0585	0.0424	0.1678	0.423313636	1
0.0338	0.0889	0.7041	0.919471765	1
-0.0515	0.0713	0.4707	0.766546602	1
-0.1285	0.1234	0.2979	0.590480357	1
0.0312	0.1048	0.7656	0.934095273	1
-0.0097	0.0789	0.9016	0.976448734	1
0.1136	0.0627	0.0697	0.236837755	1
-0.0208	0.053	0.6954	0.918921429	1
-0.1439	0.1111	0.1954	0.44325	1
0.1855	0.0956	0.0523	0.197907955	1
-0.1571	0.66	0.8119	0.951981338	1
0.2476	0.0659	2.00E-04	0.0041625	0.0666
0.2172	0.0622	5.00E-04	0.008325	0.1665
0.1602	0.1193	0.1792	0.438776471	1
0.2666	0.0951	0.005	0.04625	1
0.1072	0.0436	0.0141	0.082373684	1
0.0693	0.0411	0.092	0.283666667	1
0.0338	0.0889	0.7041	0.919471765	1
-0.0241	0.0656	0.7129	0.923718677	1
-0.1807	0.1191	0.1291	0.365745	1
0.0895	0.1004	0.3728	0.680739344	1
-0.0012	0.0719	0.9866	0.9888	1
0.0855	0.0495	0.0837	0.265143396	1
0.0053	0.0507	0.9169	0.976448734	1
-0.1531	0.1072	0.1535	0.402484252	1
0.0837	0.0771	0.2773	0.566508589	1
0.1783	0.5658	0.7527	0.934095273	1
0.2294	0.0618	2.00E-04	0.0041625	0.0666
0.2294	0.0618	2.00E-04	0.0041625	0.0666
0.158	0.0996	0.1126	0.331821239	1
0.1763	0.0944	0.0619	0.224051087	1
0.1392	0.0373	2.00E-04	0.0041625	0.0666
0.1038	0.0419	0.0132	0.07992	1
0.035	0.0891	0.6943	0.918921429	1
0.0142	0.0667	0.832	0.95574433	1
-0.1701	0.1229	0.1665	0.423240458	1
0.1049	0.1197	0.3804	0.688441304	1
-0.0188	0.0804	0.8154	0.952543007	1
0.1112	0.0528	0.0351	0.145122222	1
0.001	0.0544	0.9856	0.9888	1

-0.1548	0.1027	0.1315	0.365745	1
0.0186	0.0895	0.8351	0.95574433	1
0.3518	0.9931	0.7232	0.926252308	1
0.1368	0.065	0.0353	0.145122222	1
0.1449	0.0613	0.018	0.10159322	1
0.12	0.1083	0.2679	0.559522222	1
0.1928	0.099	0.0514	0.197907955	1
0.111	0.0439	0.0114	0.074925	1
0.124	0.0378	0.001	0.013875	0.333
0.0272	0.0928	0.7696	0.934095273	1

Genetic Covariance	Estimated Error of Genetic Covariance	Phenotype 1 Estimated Heritability	Phenotype 1 Error of Heritability Estimate	Phenotype 1 Genomic Inflation Factor (Lambda GC)	Phenotype 2 Estimated Heritability	Phenotype 2 Error of Heritability Estimate
0.0021	0.0067	0.178	0.0481	1.0802	0.0266	0.003
0.0374	0.0356	0.1641	0.0473	1.0802	0.2114	0.0586
0.0382	0.0135	0.1544	0.044	1.0802	0.0366	0.0094
0.0297	0.0135	0.1535	0.044	1.0802	0.0715	0.0071
0.0195	0.0096	0.1598	0.0461	1.0802	0.0949	0.0073
0.0663	0.0197	0.143	0.0472	1.0802	0.2379	0.017
0.0088	0.0141	0.1594	0.0487	1.0802	0.0492	0.0253
-0.0079	0.0322	0.1573	0.0473	1.0802	0.2609	0.039
-0.0159	0.0313	0.1515	0.0455	1.0802	0.4405	0.0397
-0.0246	0.0285	0.1654	0.0463	1.0802	0.4484	0.0393
0.0107	0.0246	0.1674	0.0466	1.0802	0.1426	0.0263
-0.0088	0.0354	0.1591	0.0484	1.0802	0.293	0.0541
0.0532	0.0188	0.1597	0.0479	1.0802	0.4669	0.0185
0.0424	0.021	0.1654	0.0515	1.0833	0.4715	0.0231
0.0311	0.0332	0.1648	0.0462	1.0802	0.3491	0.0435
-0.0028	0.0029	0.1495	0.0298	1.0466	0.0264	0.0028
-0.0025	0.0162	0.1282	0.0203	1.0466	0.2127	0.0581
0.0096	0.0055	0.1459	0.0269	1.0466	0.0351	0.0094
0.0169	0.0056	0.1458	0.027	1.0466	0.0707	0.0071
-0.004	0.0056	0.1495	0.0293	1.0466	0.0954	0.0077
0.0294	0.0088	0.1483	0.0319	1.0466	0.2377	0.0172
-0.0107	0.0077	0.1496	0.0296	1.0466	0.0477	0.0255
-0.025	0.015	0.1502	0.0293	1.0466	0.2654	0.0389
-0.0505	0.0683	0.1328	0.0269	0.9986	0.302	0.0206
-0.0379	0.0154	0.1461	0.0269	1.0466	0.4392	0.0398
-0.0379	0.0154	0.1461	0.0269	1.0466	0.4392	0.0398
-0.0101	0.012	0.1498	0.029	1.0466	0.1399	0.0264
-0.0341	0.0153	0.1496	0.0296	1.0466	0.2943	0.0524
-0.0026	0.0085	0.1497	0.0298	1.0466	0.4636	0.0186
-0.0079	0.0088	0.1515	0.0314	1.0466	0.4592	0.02
0.0194	0.0156	0.1509	0.03	1.0466	0.3509	0.0441
0.0063	0.0048	0.1954	0.0415	1.1301	0.0267	0.0033
0.0183	0.0278	0.1534	0.0352	1.1238	0.1814	0.0626
0.0049	0.0097	0.1941	0.0415	1.1301	0.0305	0.0084
-0.005	0.0094	0.1942	0.0415	1.1301	0.0698	0.0077
-0.004	0.0121	0.1956	0.042	1.1301	0.0971	0.01
-0.0311	0.0141	0.1999	0.0442	1.1333	0.2427	0.0184
-0.0085	0.012	0.1969	0.042	1.1301	0.0547	0.0204
0.0108	0.0224	0.196	0.042	1.1301	0.2645	0.0394
-0.0191	0.0195	0.1945	0.0414	1.1301	0.4429	0.041
-0.0191	0.0195	0.1945	0.0414	1.1301	0.4429	0.041

-0.0146	0.0189	0.1997	0.038	1.1301	0.136	0.0314
-0.0761	0.0256	0.1973	0.0417	1.1301	0.2921	0.0572
-0.0048	0.0149	0.1947	0.0414	1.1301	0.4603	0.0197
-0.0033	0.0141	0.2019	0.042	1.1301	0.4566	0.0202
-0.0123	0.0218	0.2014	0.0416	1.1301	0.3479	0.0461
-0.0028	0.0021	0.0266	0.003	1.1459	0.0843	0.0062
0.0035	0.0124	0.0816	0.0061	1.2631	0.213	0.0593
0.0024	0.004	0.0852	0.0066	1.2664	0.0366	0.0093
-8.00E-04	0.0041	0.0851	0.0066	1.2664	0.0708	0.007
0.0078	0.0029	0.0839	0.0061	1.2664	0.0955	0.0075
0.0161	0.006	0.0828	0.0068	1.2764	0.2379	0.0171
-0.0118	0.005	0.0841	0.0062	1.2697	0.0491	0.0253
-0.0141	0.0092	0.0842	0.006	1.2697	0.261	0.0391
0.0842	0.0371	0.0387	0.0081	1.1333	0.3248	0.0221
-0.0217	0.0088	0.0849	0.0065	1.2664	0.4402	0.0396
-0.0227	0.0088	0.0854	0.0064	1.2664	0.448	0.0392
0.0104	0.0074	0.0847	0.0059	1.2697	0.1436	0.026
-0.013	0.0115	0.0845	0.0064	1.2697	0.2929	0.0539
0.0046	0.0059	0.0839	0.0062	1.2664	0.4648	0.0186
0.0057	0.0069	0.0845	0.0066	1.2731	0.4716	0.0231
0.041	0.0097	0.0849	0.0062	1.2697	0.3489	0.0439
-0.0039	0.0022	0.0266	0.003	1.1459	0.0742	0.0111
0.0198	0.0108	0.0671	0.0093	1.1683	0.213	0.0593
-0.0029	0.0037	0.0738	0.0105	1.1715	0.0366	0.0093
4.00E-04	0.004	0.0739	0.0105	1.1715	0.0708	0.007
0.0083	0.0036	0.073	0.0109	1.1747	0.0955	0.0075
0.0157	0.0061	0.0719	0.0121	1.1811	0.2379	0.0171
-0.0041	0.0051	0.0733	0.011	1.1747	0.0492	0.0253
0.0098	0.0078	0.0728	0.011	1.1747	0.2609	0.0391
-0.0015	0.0405	0.0356	0.0096	1.1144	0.3248	0.0221
9.00E-04	0.0097	0.0738	0.0105	1.1715	0.4402	0.0396
2.00E-04	0.0097	0.0747	0.0106	1.1715	0.4481	0.0392
0.0153	0.0082	0.0734	0.0108	1.1779	0.1436	0.026
0.0022	0.0101	0.0731	0.0112	1.1779	0.293	0.0539
0.0107	0.006	0.0732	0.0109	1.1747	0.4648	0.0186
0.0085	0.0066	0.0751	0.0116	1.1811	0.4716	0.0231
0.0193	0.0099	0.0729	0.011	1.1779	0.3489	0.0439
-0.002	0.0038	0.0262	0.0029	1.1459	0.0796	0.0174
0.0025	0.0221	0.0827	0.0177	1.0466	0.2006	0.0577
0.0132	0.0079	0.0774	0.0166	1.0496	0.0358	0.0093
-0.0012	0.0066	0.0774	0.0166	1.0496	0.0705	0.0071
0.004	0.0065	0.0799	0.0175	1.0496	0.0953	0.0079
0.0128	0.0103	0.0789	0.018	1.0527	0.2377	0.0178
0.0066	0.0083	0.0778	0.0173	1.0496	0.0493	0.0256
0.0191	0.015	0.0802	0.0174	1.0496	0.2636	0.0395
0.0229	0.0826	0.1075	0.0368	1.0557	0.3055	0.0194
0.0071	0.0161	0.076	0.0166	1.0496	0.4384	0.0394

0.0071	0.0161	0.076	0.0166	1.0496	0.4384	0.0394
0.0039	0.0145	0.0834	0.0174	1.0527	0.1414	0.0267
-8.00E-04	0.0185	0.0804	0.0177	1.0527	0.2898	0.053
0.0067	0.0099	0.0799	0.0174	1.0496	0.4627	0.019
0.0075	0.0107	0.0785	0.0177	1.0527	0.4589	0.0199
-0.013	0.0178	0.0793	0.0176	1.0527	0.3511	0.0443
-3.00E-04	0.0022	0.0266	0.003	1.1459	0.0718	0.0062
0.0302	0.0126	0.0707	0.0065	1.1523	0.213	0.0593
6.00E-04	0.0044	0.0723	0.0061	1.1587	0.0366	0.0093
0.0077	0.0045	0.0722	0.0061	1.1587	0.0708	0.007
0.011	0.0034	0.0715	0.0061	1.1587	0.0955	0.0075
0.0257	0.0071	0.0688	0.0065	1.1651	0.2379	0.0171
-0.0056	0.0051	0.071	0.0064	1.1587	0.0492	0.0253
0.0127	0.0103	0.0718	0.0062	1.1587	0.2609	0.0391
0.0228	0.0459	0.058	0.0124	1.0988	0.3248	0.0221
0.0172	0.0097	0.0722	0.0061	1.1587	0.4402	0.0396
0.0182	0.0093	0.0727	0.006	1.1587	0.4481	0.0392
0.017	0.0077	0.0715	0.0061	1.1587	0.1436	0.026
0.004	0.0124	0.0708	0.0064	1.1587	0.293	0.0539
0.0077	0.0065	0.0712	0.0063	1.1587	0.4648	0.0186
0.0102	0.0066	0.0715	0.0066	1.1651	0.4716	0.0231
-6.00E-04	0.011	0.07	0.0063	1.1619	0.3489	0.0439
-0.0034	0.0031	0.0257	0.0029	1.1396	0.1291	0.0255
0.0193	0.0166	0.1246	0.0238	1.0988	0.2071	0.0605
0.0254	0.0054	0.1293	0.0254	1.105	0.0365	0.0094
0.0295	0.006	0.1291	0.0254	1.105	0.0714	0.0071
-0.0033	0.0066	0.1297	0.0252	1.105	0.0957	0.0069
0.0409	0.0096	0.1293	0.0281	1.1082	0.2401	0.0172
0.0046	0.0098	0.1299	0.0239	1.105	0.0537	0.0211
-0.0545	0.0133	0.1281	0.0253	1.105	0.2661	0.0366
0.071	0.0679	0.0617	0.024	1.0618	0.3235	0.0222
0.0021	0.0131	0.1289	0.0255	1.105	0.4405	0.0396
0.0021	0.0131	0.1289	0.0255	1.105	0.4405	0.0396
0.0285	0.0128	0.1308	0.0261	1.105	0.1387	0.0277
-0.0362	0.0149	0.1284	0.0259	1.105	0.3014	0.0545
-0.012	0.009	0.1296	0.0254	1.105	0.4603	0.0187
-0.0104	0.0102	0.1284	0.0274	1.1082	0.4549	0.0199
0.0056	0.0147	0.1289	0.0269	1.105	0.3492	0.0448
-0.0033	0.0022	0.0266	0.003	1.1459	0.0557	0.0089
0.0024	0.0114	0.0559	0.0102	1.105	0.213	0.0593
0.0023	0.0032	0.0531	0.0086	1.1113	0.0366	0.0093
0.0077	0.0038	0.053	0.0086	1.1113	0.0708	0.007
0.0178	0.0048	0.0543	0.0086	1.1144	0.0955	0.0075
0.0169	0.0067	0.0543	0.0091	1.1175	0.2379	0.0171
-0.0056	0.0052	0.0537	0.0088	1.1113	0.0492	0.0253
-0.0026	0.0096	0.054	0.0087	1.1113	0.2609	0.0391
0.0036	0.0438	0.0265	0.0117	1.0679	0.3248	0.0221

0.0172	0.0095	0.0527	0.0086	1.1113	0.4402	0.0396
0.0164	0.0092	0.0542	0.0084	1.1113	0.4481	0.0392
0.0291	0.008	0.0538	0.0089	1.1113	0.1436	0.026
-0.0173	0.0112	0.0537	0.009	1.1113	0.293	0.0539
0.0118	0.0066	0.0539	0.0086	1.1113	0.4648	0.0186
0.0092	0.0072	0.0554	0.009	1.1175	0.4716	0.0231
0.0114	0.0101	0.0523	0.0089	1.1144	0.3489	0.0439
0.0039	0.0069	0.0272	0.0031	1.1459	0.3655	0.0662
-0.0159	0.0379	0.3432	0.066	1.0436	0.2134	0.0597
0.0155	0.0125	0.3561	0.0652	1.0527	0.0352	0.01
0.0159	0.0125	0.356	0.0653	1.0527	0.0693	0.0074
0.0041	0.0135	0.365	0.0677	1.0557	0.0958	0.0093
0.0215	0.0197	0.3852	0.0707	1.0557	0.2412	0.0172
-0.027	0.0173	0.3575	0.0654	1.0557	0.048	0.0294
-0.0185	0.0291	0.3652	0.0675	1.0557	0.2665	0.0405
0.1273	0.1391	0.2957	0.1168	1.0345	0.2414	0.0197
0.0766	0.0275	0.3558	0.0643	1.0527	0.442	0.0415
0.0766	0.0275	0.3558	0.0643	1.0527	0.442	0.0415
-0.0051	0.027	0.3652	0.0665	1.0557	0.1338	0.028
0.0517	0.0372	0.3651	0.068	1.0557	0.3046	0.0537
0.058	0.0192	0.3661	0.0666	1.0557	0.4634	0.0199
0.0558	0.0208	0.3874	0.0696	1.0557	0.4639	0.0206
0.0307	0.0316	0.3765	0.0675	1.0557	0.3487	0.0462
-0.0137	0.0103	0.0265	0.0027	1.1459	0.8043	0.1344
-0.019	0.0578	0.6783	0.1351	1.0345	0.2168	0.0591
0.0342	0.0206	0.7777	0.1315	1.0345	0.0355	0.0093
0.0225	0.0207	0.777	0.1313	1.0345	0.0718	0.007
-2.00E-04	0.0148	0.8065	0.1304	1.0345	0.0953	0.0067
0.0957	0.0277	0.7131	0.1453	1.0405	0.2375	0.0173
-0.003	0.0241	0.7968	0.1365	1.0345	0.049	0.0254
-0.0251	0.041	0.8085	0.1302	1.0345	0.2618	0.0378
0.1471	0.2344	1.2409	0.3498	1.0496	0.3033	0.0229
0.1429	0.0493	0.776	0.1309	1.0345	0.4401	0.0392
0.1429	0.0493	0.776	0.1309	1.0345	0.4401	0.0392
0.0037	0.0404	0.8262	0.1308	1.0345	0.1408	0.0273
0.0088	0.0557	0.7888	0.1385	1.0375	0.2887	0.0572
0.0606	0.0266	0.8102	0.1337	1.0345	0.4647	0.0188
0.0519	0.028	0.7613	0.1382	1.0375	0.4603	0.0191
0.1334	0.0503	0.7921	0.1376	1.0375	0.3511	0.0444
-0.0046	0.0049	0.0263	0.0029	1.1459	0.2479	0.0445
-0.0035	0.03	0.2184	0.0434	1.1587	0.2214	0.059
0.0021	0.0086	0.2509	0.0458	1.1715	0.0355	0.0092
0.013	0.0093	0.251	0.0458	1.1715	0.0706	0.007
-0.0053	0.0171	0.2495	0.0437	1.1747	0.0956	0.0085
0.0112	0.0133	0.2498	0.0412	1.1779	0.2393	0.017
7.00E-04	0.0115	0.251	0.0446	1.1747	0.0476	0.0262
0.0035	0.0233	0.251	0.0443	1.1747	0.2646	0.037

0.0195	0.0206	0.2481	0.0454	1.1715	0.4414	0.0395
0.0195	0.0206	0.2481	0.0454	1.1715	0.4414	0.0395
0.0153	0.0222	0.248	0.0417	1.1747	0.1415	0.0278
-0.0119	0.0248	0.2498	0.0443	1.1747	0.2976	0.0526
0.0498	0.0166	0.2486	0.0443	1.1747	0.4654	0.0186
0.0495	0.017	0.2596	0.0401	1.1747	0.4588	0.0205
0.0345	0.0223	0.2487	0.0444	1.1747	0.3476	0.0453
0.0118	0.0075	0.0267	0.0029	1.1364	0.3103	0.0494
-0.0278	0.0569	0.3092	0.1019	1.0165	0.307	0.0708
0.0044	0.0139	0.0381	0.0098	1.0436	0.3098	0.0496
-0.013	0.0152	0.0708	0.0085	1.0772	0.3098	0.0496
6.00E-04	0.012	0.0968	0.0099	1.2365	0.313	0.0486
-0.0336	0.0196	0.2496	0.0182	1.2498	0.2689	0.0528
0.0017	0.0161	0.0344	0.0337	1.1019	0.3083	0.05
0.002	0.0283	0.3095	0.0449	1.0679	0.314	0.0489
-0.0771	0.2187	0.3263	0.0229	8.7405	0.1505	0.1315
0.1159	0.0325	0.4605	0.044	1.1396	0.3098	0.0497
0.1159	0.0325	0.4605	0.044	1.1396	0.3098	0.0497
0.0407	0.0268	0.1284	0.034	1.0679	0.3159	0.0507
0.1102	0.0393	0.2094	0.0597	1.0466	0.3134	0.0501
0.0375	0.021	0.4646	0.0211	1.5659	0.3105	0.0496
0.053	0.0208	0.4702	0.0214	1.5808	0.303	0.0507
0.0049	0.0328	0.3539	0.0556	1.105	0.2954	0.0525
-0.0031	0.0074	0.0272	0.0029	1.1459	0.4996	0.0713
-0.0498	0.0342	0.1924	0.0704	1.0225	0.4921	0.0715
0.0163	0.0121	0.0343	0.0101	1.0588	0.4997	0.0712
-0.0071	0.0125	0.0656	0.0078	1.0988	0.4996	0.0713
0.0042	0.0098	0.0961	0.0079	1.2664	0.5017	0.0738
0.0019	0.0167	0.2401	0.0187	1.2731	0.4967	0.0749
-0.0094	0.0146	0.0478	0.0253	1.0988	0.4984	0.0727
-6.00E-04	0.0266	0.2683	0.0409	1.0833	0.5009	0.0736
0.1065	0.1248	0.1893	0.0175	8.7405	0.2705	0.0977
0.0659	0.0296	0.4537	0.0409	1.1555	0.4995	0.071
0.0659	0.0296	0.4537	0.0409	1.1555	0.4995	0.071
-0.0133	0.0226	0.1419	0.031	1.0741	0.5	0.0741
0.0124	0.036	0.301	0.0565	1.0588	0.4989	0.0727
0.0429	0.0189	0.4554	0.0207	1.6296	0.4997	0.0727
0.0395	0.0191	0.4578	0.021	1.6372	0.5155	0.0738
-6.00E-04	0.0291	0.3446	0.0476	1.1144	0.5037	0.0722
-0.0034	0.007	0.0278	0.003	1.1491	0.5028	0.0673
-0.0498	0.0342	0.1924	0.0704	1.0225	0.4921	0.0715
0.0163	0.0121	0.0343	0.0101	1.0588	0.4997	0.0712
-0.0071	0.0125	0.0656	0.0078	1.0988	0.4996	0.0713
0.0042	0.0098	0.0961	0.0079	1.2664	0.5017	0.0738
0.0019	0.0167	0.2401	0.0187	1.2731	0.4967	0.0749
-0.0094	0.0146	0.0478	0.0253	1.0988	0.4984	0.0727
-6.00E-04	0.0266	0.2683	0.0409	1.0833	0.5009	0.0736

0.1065	0.1248	0.1893	0.0175	8.7405	0.2705	0.0977
0.0659	0.0296	0.4537	0.0409	1.1555	0.4995	0.071
0.0706	0.0283	0.4535	0.042	1.1555	0.4992	0.0671
-0.0133	0.0226	0.1419	0.031	1.0741	0.5	0.0741
0.0124	0.036	0.301	0.0565	1.0588	0.4989	0.0727
0.0429	0.0189	0.4554	0.0207	1.6296	0.4997	0.0727
0.041	0.0189	0.4669	0.0228	1.6145	0.5099	0.0734
-6.00E-04	0.0291	0.3446	0.0476	1.1144	0.5037	0.0722
-0.0024	0.0061	0.026	0.0028	1.1459	0.4874	0.062
-0.0365	0.0311	0.21	0.0587	1.0165	0.4445	0.0635
0.0253	0.0105	0.0366	0.0094	1.0557	0.4806	0.0621
-0.0039	0.0106	0.0713	0.0071	1.0926	0.4808	0.0621
0.0059	0.0086	0.095	0.0075	1.2531	0.4877	0.0603
0.0098	0.0152	0.2379	0.017	1.2631	0.4712	0.0636
-0.0137	0.0137	0.0492	0.0253	1.0957	0.4837	0.0637
-0.0184	0.0258	0.2608	0.039	1.0802	0.4848	0.0611
-0.0078	0.104	0.3388	0.0236	8.7142	0.2662	0.0846
0.0956	0.0237	0.4412	0.0397	1.1491	0.4793	0.0621
0.0956	0.0237	0.4412	0.0397	1.1491	0.4793	0.0621
-0.0022	0.0195	0.1429	0.0262	1.071	0.496	0.0638
0.0242	0.0318	0.2929	0.0543	1.0557	0.4833	0.0607
0.0584	0.0155	0.467	0.0185	1.607	0.4887	0.0626
0.0492	0.0168	0.4593	0.02	1.6259	0.4862	0.0642
0.0132	0.0278	0.3496	0.044	1.1113	0.4832	0.0604
-0.0033	0.0069	0.0288	0.0031	1.1523	0.4934	0.0664
-0.0481	0.032	0.2142	0.0614	1.0195	0.4517	0.0666
0.0236	0.012	0.0332	0.0095	1.0588	0.4808	0.0671
-0.0105	0.0123	0.0653	0.007	1.0988	0.4809	0.0671
-3.00E-04	0.0094	0.0964	0.0093	1.2697	0.4896	0.0663
0.0116	0.017	0.2404	0.0174	1.2731	0.4841	0.0694
-0.019	0.0131	0.0499	0.0251	1.0988	0.4877	0.0663
-0.03	0.0263	0.2436	0.0397	1.0864	0.4898	0.0662
0.0131	0.1238	0.1865	0.0173	8.7405	0.2723	0.0963
0.07	0.0273	0.4431	0.0424	1.1555	0.4806	0.0671
0.0743	0.0252	0.4524	0.0383	1.1523	0.4988	0.0614
-0.0166	0.0208	0.1401	0.0302	1.0741	0.5031	0.0666
0.0241	0.0348	0.3112	0.0554	1.0588	0.4901	0.0674
0.0508	0.0188	0.4567	0.0204	1.641	0.4906	0.0673
0.0479	0.017	0.4707	0.0227	1.6145	0.5115	0.0619
0.0067	0.0313	0.361	0.0463	1.1144	0.489	0.0681
-0.0037	0.0054	0.0261	0.0029	1.1428	0.207	0.0401
-0.029	0.0283	0.2134	0.0586	1.0165	0.2386	0.0358
0.0029	0.0096	0.0371	0.0095	1.0557	0.2312	0.0368
-0.0013	0.0101	0.072	0.0071	1.0926	0.2315	0.0368
0.016	0.0086	0.0957	0.0075	1.2531	0.2066	0.0403
-0.0051	0.013	0.2397	0.0167	1.2631	0.2502	0.0411
-0.0155	0.0114	0.0506	0.0248	1.0957	0.2305	0.0407

0.0449	0.0235	0.2635	0.0387	1.0802	0.2228	0.04
-0.0218	0.0912	0.3378	0.0209	8.7142	0.0572	0.0657
0.0793	0.021	0.4418	0.0391	1.1491	0.2321	0.0366
0.0793	0.021	0.4418	0.0391	1.1491	0.2321	0.0366
0.0287	0.0202	0.1427	0.0264	1.071	0.2246	0.0415
0.0704	0.0248	0.303	0.0518	1.0557	0.2299	0.0395
0.0334	0.0136	0.4675	0.0184	1.607	0.2073	0.04
0.0202	0.0148	0.4597	0.0197	1.6259	0.2606	0.0411
0.0098	0.0255	0.3505	0.0446	1.1082	0.2384	0.0394
-0.0039	0.0054	0.0266	0.003	1.1459	0.2137	0.0397
-0.029	0.0283	0.2134	0.0586	1.0165	0.2386	0.0358
0.0029	0.0096	0.0371	0.0095	1.0557	0.2312	0.0368
-0.0013	0.0101	0.072	0.0071	1.0926	0.2315	0.0368
0.016	0.0086	0.0957	0.0075	1.2531	0.2066	0.0403
-0.0051	0.013	0.2397	0.0167	1.2631	0.2502	0.0411
-0.0155	0.0114	0.0506	0.0248	1.0957	0.2305	0.0407
0.0449	0.0235	0.2635	0.0387	1.0802	0.2228	0.04
-0.0218	0.0912	0.3378	0.0209	8.7142	0.0572	0.0657
0.0793	0.021	0.4418	0.0391	1.1491	0.2321	0.0366
0.0679	0.0201	0.4401	0.036	1.1459	0.2221	0.0354
0.0287	0.0202	0.1427	0.0264	1.071	0.2246	0.0415
0.0704	0.0248	0.303	0.0518	1.0557	0.2299	0.0395
0.0334	0.0136	0.4675	0.0184	1.607	0.2073	0.04
0.0231	0.0139	0.4717	0.0219	1.592	0.2356	0.0389
0.0098	0.0255	0.3505	0.0446	1.1082	0.2384	0.0394
-0.0019	0.0052	0.026	0.0028	1.1459	0.2422	0.0343
-0.0382	0.0253	0.2097	0.0586	1.0165	0.2128	0.0324
0.0083	0.0091	0.0366	0.0094	1.0557	0.234	0.0328
-2.00E-04	0.0093	0.0713	0.0071	1.0926	0.2339	0.0328
0.0131	0.0076	0.095	0.0074	1.2531	0.2453	0.0347
0.0012	0.0119	0.2379	0.017	1.2631	0.2316	0.037
-0.0166	0.0106	0.0492	0.0253	1.0957	0.2386	0.0354
0.0211	0.0196	0.2609	0.039	1.0802	0.2443	0.0348
0.0308	0.0942	0.3388	0.0236	8.7142	0.088	0.0583
0.0734	0.0199	0.4411	0.0397	1.1491	0.2322	0.0326
0.0734	0.0199	0.4411	0.0397	1.1491	0.2322	0.0326
0.0296	0.0179	0.1428	0.0262	1.071	0.2451	0.0349
0.0466	0.0252	0.2929	0.0543	1.0557	0.2386	0.0347
0.0471	0.013	0.4669	0.0185	1.607	0.2454	0.0338
0.0338	0.0142	0.4593	0.02	1.6259	0.2303	0.0372
0.01	0.0253	0.3496	0.044	1.1113	0.2351	0.0351
0.0012	0.0053	0.0288	0.0032	1.1491	0.2321	0.0376
-0.035	0.0255	0.2114	0.0631	1.0195	0.2001	0.0333
0.0086	0.0094	0.0305	0.0095	1.0588	0.2184	0.0361
-0.0023	0.0096	0.066	0.0074	1.0988	0.2183	0.0361
0.0165	0.0078	0.0972	0.008	1.2664	0.2274	0.0365
2.00E-04	0.0127	0.2404	0.0178	1.2697	0.229	0.0377

-0.0175	0.0109	0.0568	0.0221	1.0988	0.2254	0.0374
0.0044	0.0212	0.2484	0.0397	1.0864	0.2277	0.0365
0.0372	0.0975	0.1991	0.0178	8.7317	0.0563	0.0577
0.0422	0.0204	0.4355	0.0424	1.1555	0.2182	0.036
0.0465	0.02	0.4444	0.0391	1.1523	0.2316	0.0339
0.0216	0.0189	0.1414	0.0296	1.0741	0.2297	0.0375
0.0507	0.0268	0.3034	0.054	1.0588	0.2279	0.0368
0.036	0.0148	0.4614	0.0216	1.6334	0.2283	0.0366
0.0425	0.0135	0.4745	0.0195	1.6032	0.2471	0.0346
0.0078	0.0263	0.3613	0.0437	1.1113	0.2265	0.0372

Phenotype 2 Genomic Inflation Factor (Lambda GC)
1.1459
1.0165
1.0557
1.0926
1.2531
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Original Sequence	Trait1, Trait2	Locus (HG19) Chr:BPStart-BPStop	Number of SNPs Evaluated
1	ADHD, C-Reactive Protein	3:139954597-141339097	781
2	ADHD, C-Reactive Protein	4:127275477-127830293	414
3	ADHD, C-Reactive Protein	7:121933630-124156805	1563
4	ADHD, C-Reactive Protein	11:49866050-54695473	303
5	ADHD, C-Reactive Protein	11:54695473-55082657	32
6	ADHD, C-Reactive Protein	11:123500117-124495528	981
7	ADHD, C-Reactive Protein	13:54682864-55817131	836
8	ADHD,Childhood Ear Infection	3:49316972-51832015	2053
9	ADHD,Childhood Ear Infection	4:91560677-94233299	3242
10	ADHD,Childhood Ear Infection	7:2062398-2772227	1177
11	ADHD, Psoriasis	2:214014282-215573795	2029
12	ADHD, Psoriasis	6:97093511-97842284	1053
13	ADHD, Psoriasis	8:65232872-66489090	1381
14	ADHD, Psoriasis	17:50719055-51826118	1697
15	ADHD, Psoriasis	20:24717724-25344231	1303
16	ADHD, Rheumatoid Arthritis	3:47727212-49316972	916
17	ADHD, Rheumatoid Arthritis	6:23936619-24852275	1685
18	ADHD, Rheumatoid Arthritis	6:137614218-138822629	1821
19	ADHD, Rheumatoid Arthritis	7:2062398-2772227	1103
20	ADHD, Rheumatoid Arthritis	20:42680176-44839056	3183
21	Bipolar Disorder, Celiac Disease	1:200137649-201589975	190
22	Bipolar Disorder, Celiac Disease	2:64625913-65933444	151
23	Bipolar Disorder, Celiac Disease	3:168580960-170964909	245
24	Bipolar Disorder, Celiac Disease	4:3846040-4684116	64
25	Bipolar Disorder, Celiac Disease	4:74592390-77130707	189
26	Bipolar Disorder, Celiac Disease	5:13464832-14757804	164
27	Bipolar Disorder, Celiac Disease	6:55468270-56105313	58
28	Bipolar Disorder, Celiac Disease	6:57599465-61880512	21
29	Bipolar Disorder, Celiac Disease	6:65765742-67329215	164
30	Bipolar Disorder, Celiac Disease	6:137614218-138822629	172
31	Bipolar Disorder, Celiac Disease	7:5854526-6573857	40
32	Bipolar Disorder, Celiac Disease	7:134307596-135591083	143
33	Bipolar Disorder, Celiac Disease	7:139933177-140235210	47
34	Bipolar Disorder, Celiac Disease	7:140235210-141226557	82
35	Bipolar Disorder, Celiac Disease	8:6142797-7153079	144
36	Bipolar Disorder, Celiac Disease	8:75445064-76456542	116
37	Bipolar Disorder, Celiac Disease	9:34642243-36743283	202
38	Bipolar Disorder, Celiac Disease	10:80876749-82414679	130
39	Bipolar Disorder, Celiac Disease	10:102949239-104380410	82
40	Bipolar Disorder, Celiac Disease	10:129154362-130844284	271
41	Bipolar Disorder, Celiac Disease	11:15742552-17578402	157
42	Bipolar Disorder, Celiac Disease	11:94242260-95726041	170

43	Bipolar Disorder, Celiac Disease	12:11754846-12733528	157
44	Bipolar Disorder, Celiac Disease	14:55233681-56216880	68
45	Bipolar Disorder, Celiac Disease	14:57481262-59448336	201
46	Bipolar Disorder, Celiac Disease	14:103012102-105001723	145
47	Bipolar Disorder, Celiac Disease	15:59694116-61265836	202
48	Bipolar Disorder, Celiac Disease	16:63691589-65938566	257
49	Bipolar Disorder, Celiac Disease	17:76263413-77298636	159
50	Bipolar Disorder, Celiac Disease	18:36365490-37684367	105
51	Bipolar Disorder, Crohn's Disease	2:69139564-70755198	2279
52	Bipolar Disorder, Crohn's Disease	3:47727212-49316972	985
53	Bipolar Disorder, Crohn's Disease	3:49316972-51832015	2063
54	Bipolar Disorder, Crohn's Disease	3:190226607-192343814	4450
55	Bipolar Disorder, Crohn's Disease	6:110304247-112345014	2808
56	Bipolar Disorder, Crohn's Disease	6:117672972-118963115	1938
57	Bipolar Disorder, Crohn's Disease	8:126410917-128659111	4264
58	Bipolar Disorder, Crohn's Disease	10:63341695-65794114	4029
59	Bipolar Disorder, Crohn's Disease	11:26045753-27020461	1936
60	Bipolar Disorder, Crohn's Disease	13:54682864-55817131	1920
61	Bipolar Disorder, Crohn's Disease	17:36809344-38877404	2321
62	Bipolar Disorder, Crohn's Disease	21:46177105-47492226	3047
63	Bipolar Disorder, Psoriasis	1:224940000-226810000	2127
64	Bipolar Disorder, Psoriasis	18:14441000-19486000	1344
65	Bipolar Disorder, Psoriasis	18:36365000-37684000	1380
66	Bipolar Disorder, Ulcerative Colitis	1:200137649-201589975	2781
67	Bipolar Disorder, Ulcerative Colitis	1:204681068-206073265	2207
68	Bipolar Disorder, Ulcerative Colitis	9:117019801-117921960	1625
69	Bipolar Disorder, Ulcerative Colitis	13:57554217-58410626	1294
70	Bipolar Disorder, Ulcerative Colitis	17:36809344-38877404	2321
71	Neuroticism, Childhood Ear Infection	1:93536459-94506191	1197
72	Neuroticism, Childhood Ear Infection	2:175588929-177363636	2522
73	Neuroticism, Childhood Ear Infection	3:49316972-51832015	2061
74	Neuroticism, Childhood Ear Infection	4:105305294-107501305	3004
75	Neuroticism, Childhood Ear Infection	6:21684065-22748307	2354
76	Neuroticism, Childhood Ear Infection	7:22507629-23471442	1547
77	Neuroticism, Childhood Ear Infection	8:13944992-15991660	5740
78	Neuroticism, Childhood Ear Infection	9:34642243-36743283	2711
79	Neuroticism, Childhood Ear Infection	10:18537267-19716878	3025
80	Neuroticism, Childhood Ear Infection	11:33958739-35502605	3399
81	Neuroticism, Childhood Ear Infection	11:62223771-63804569	1600
82	Neuroticism, Childhood Ear Infection	14:51493572-53474383	3971
83	Neuroticism, Childhood Ear Infection	19:32746520-34262952	3116
84	Neuroticism, Childhood Ear Infection	20:9730921-11249536	2973
85	Neuroticism, Hypothyroidsm	2:161769733-163503551	1528
86	Neuroticism, Hypothyroidsm	3:38356116-40221298	3156
87	Neuroticism, Hypothyroidsm	3:51832015-54081390	2524
88	Neuroticism, Hypothyroidsm	8:7153079-9154694	2808

89	Neuroticism, Hypothyroidsm	8:9640787-10463197	2063
90	Neuroticism, Hypothyroidsm	8:11278998-13491775	4499
91	Neuroticism, Hypothyroidsm	8:79132861-81956395	3795
92	Neuroticism, Hypothyroidsm	10:112561493-115328432	3850
93	Neuroticism, Hypothyroidsm	11:47006137-49866050	4529
94	Neuroticism, Hypothyroidsm	12:113263518-113986709	1077
95	Neuroticism, Hypothyroidsm	13:75670143-77410555	3264
96	Neuroticism, Hypothyroidsm	14:80186579-81579714	2417
97	Neuroticism, Hypothyroidsm	17:31538425-32912798	3058
98	Neuroticism, Hypothyroidsm	18:77149991-78017158	2041
99	OCD, Type 1 Diabetes	16:27446000-29037000	458
100	Schizophrenia, Crohn's Disease	1:1892607-3582736	3295
101	Schizophrenia, Crohn's Disease	1:5913893-7247335	2142
102	Schizophrenia, Crohn's Disease	1:7247335-9365199	3493
103	Schizophrenia, Crohn's Disease	1:30161881-32438685	4269
104	Schizophrenia, Crohn's Disease	1:34799758-37549183	2970
105	Schizophrenia, Crohn's Disease	1:44969183-46899501	2561
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131	Schizophrenia, Crohn's Disease	2:164466638-165178840	819
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198	Schizophrenia, Crohn's Disease	6:170330173-171051270	1451
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220	Schizophrenia, Crohn's Disease	8:59068651-59728100	1340
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222	Schizophrenia, Crohn's Disease	8:116096495-119685457	4380
223	Schizophrenia, Crohn's Disease	8:125683719-126410917	1226
224	Schizophrenia, Crohn's Disease	8:126410917-128659111	4264
225	Schizophrenia, Crohn's Disease	8:133351144-134570001	2463
226	Schizophrenia, Crohn's Disease	8:136035605-137524151	2677
227	Schizophrenia, Crohn's Disease	8:137524151-139254830	4089
228	Schizophrenia, Crohn's Disease	9:10023-1079707	2675
229	Schizophrenia, Crohn's Disease	9:7154923-8456299	3530

230	Schizophrenia, Crohn's Disease	9:12276489-14836363	5151
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233	Schizophrenia, Crohn's Disease	9:31310383-32019368	1639
234	Schizophrenia, Crohn's Disease	9:90136246-92528698	4525
235	Schizophrenia, Crohn's Disease	9:92528698-94167203	2804
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802	Schizophrenia, Systemic Lupus Erythematous	22:26791628-27834752	2400
803	Schizophrenia, Systemic Lupus Erythematous	22:39307894-40545797	1685
804	Schizophrenia, Systemic Lupus Erythematous	22:43714200-44995308	2800
805	Schizophrenia, Systemic Lupus Erythematous	22:46470495-47596318	2376
806	Schizophrenia, Systemic Lupus Erythematous	22:47596318-48903703	2967
807	Schizophrenia, Ulcerative Colitis	1:27401867-30161881	2928
808	Schizophrenia, Ulcerative Colitis	1:30161881-32438685	4269
809	Schizophrenia, Ulcerative Colitis	1:48002576-48978188	1232
810	Schizophrenia, Ulcerative Colitis	1:74326907-76728135	3556
811	Schizophrenia, Ulcerative Colitis	1:83991748-84844495	1213
812	Schizophrenia, Ulcerative Colitis	1:91886317-93536459	2436
813	Schizophrenia, Ulcerative Colitis	1:93536459-94506191	1200
814	Schizophrenia, Ulcerative Colitis	1:96150893-97885249	2738
815	Schizophrenia, Ulcerative Colitis	1:106087842-108409665	3658
816	Schizophrenia, Ulcerative Colitis	1:114873845-115880593	1412
817	Schizophrenia, Ulcerative Colitis	1:165191702-166460517	2251
818	Schizophrenia, Ulcerative Colitis	1:173097907-175089768	2448
819	Schizophrenia, Ulcerative Colitis	1:186810023-188759945	4661
820	Schizophrenia, Ulcerative Colitis	1:188759945-189904130	1535
821	Schizophrenia, Ulcerative Colitis	1:194107442-196176201	4154
822	Schizophrenia, Ulcerative Colitis	1:197311514-199239884	2236
823	Schizophrenia, Ulcerative Colitis	1:200137649-201589975	2781
824	Schizophrenia, Ulcerative Colitis	1:219590571-221858231	3649
825	Schizophrenia, Ulcerative Colitis	1:222230220-224938520	3976
826	Schizophrenia, Ulcerative Colitis	1:224938520-226810860	2667
827	Schizophrenia, Ulcerative Colitis	2:6836254-8422147	2657
828	Schizophrenia, Ulcerative Colitis	2:44313803-46482634	4176
829	Schizophrenia, Ulcerative Colitis	2:50818928-52491133	3007
830	Schizophrenia, Ulcerative Colitis	2:54685226-56203345	2751
831	Schizophrenia, Ulcerative Colitis	2:57429100-58297315	1775
832	Schizophrenia, Ulcerative Colitis	2:69139564-70755198	2279
833	Schizophrenia, Ulcerative Colitis	2:70755198-73174848	3840
834	Schizophrenia, Ulcerative Colitis	2:110572432-113921856	3601
835	Schizophrenia, Ulcerative Colitis	2:144519484-146445570	1648
836	Schizophrenia, Ulcerative Colitis	2:199311125-201576284	2419
837	Schizophrenia, Ulcerative Colitis	2:212379518-214014282	3232
838	Schizophrenia, Ulcerative Colitis	2:239952643-241560084	4087
839	Schizophrenia, Ulcerative Colitis	2:241560084-242149921	1353
840	Schizophrenia, Ulcerative Colitis	3:11019665-13070799	3500

841	Schizophrenia, Ulcerative Colitis	3:29142260-30717955	3272
842	Schizophrenia, Ulcerative Colitis	3:30717955-32351715	2925
843	Schizophrenia, Ulcerative Colitis	3:38356116-40221298	3171
844	Schizophrenia, Ulcerative Colitis	3:42540002-45165153	3033
845	Schizophrenia, Ulcerative Colitis	3:54081390-55348860	2447
846	Schizophrenia, Ulcerative Colitis	3:58157519-60272906	4083
847	Schizophrenia, Ulcerative Colitis	3:69276762-70449028	2124
848	Schizophrenia, Ulcerative Colitis	3:74321817-75704949	2482
849	Schizophrenia, Ulcerative Colitis	3:106982811-109522395	4052
850	Schizophrenia, Ulcerative Colitis	3:115447080-116800153	2374
851	Schizophrenia, Ulcerative Colitis	3:139954597-141339097	1888
852	Schizophrenia, Ulcerative Colitis	3:143164628-144410816	1911
853	Schizophrenia, Ulcerative Colitis	3:175116539-176320287	2173
854	Schizophrenia, Ulcerative Colitis	3:179374586-181511166	2538
855	Schizophrenia, Ulcerative Colitis	3:194786674-195971408	2306
856	Schizophrenia, Ulcerative Colitis	4:2842979-3846040	1816
857	Schizophrenia, Ulcerative Colitis	4:29762208-30454535	1075
858	Schizophrenia, Ulcerative Colitis	4:55429556-56547644	2074
859	Schizophrenia, Ulcerative Colitis	4:56547644-58935008	4889
860	Schizophrenia, Ulcerative Colitis	4:74592390-77130707	4315
861	Schizophrenia, Ulcerative Colitis	4:100678360-103221356	4551
862	Schizophrenia, Ulcerative Colitis	4:130591885-131283821	1135
863	Schizophrenia, Ulcerative Colitis	4:136566407-138541971	4003
864	Schizophrenia, Ulcerative Colitis	4:138541971-139556511	1908
865	Schizophrenia, Ulcerative Colitis	4:164478234-165823448	2531
866	Schizophrenia, Ulcerative Colitis	4:165823448-167018858	2302
867	Schizophrenia, Ulcerative Colitis	5:8446336-9718832	2748
868	Schizophrenia, Ulcerative Colitis	5:9718832-11173271	2994
869	Schizophrenia, Ulcerative Colitis	5:23494324-26184851	4908
870	Schizophrenia, Ulcerative Colitis	5:35048970-36433954	2116
871	Schizophrenia, Ulcerative Colitis	5:40287729-41888710	2777
872	Schizophrenia, Ulcerative Colitis	5:63968304-65911286	2966
873	Schizophrenia, Ulcerative Colitis	5:103320005-104851483	2584
874	Schizophrenia, Ulcerative Colitis	5:105893055-107264196	2541
875	Schizophrenia, Ulcerative Colitis	5:108633934-110821144	3360
876	Schizophrenia, Ulcerative Colitis	5:114830370-115831047	2187
877	Schizophrenia, Ulcerative Colitis	5:123798100-125785649	4226
878	Schizophrenia, Ulcerative Colitis	5:125785649-127344604	2067
879	Schizophrenia, Ulcerative Colitis	5:147181998-148662624	2299
880	Schizophrenia, Ulcerative Colitis	5:153773088-155373505	2702
881	Schizophrenia, Ulcerative Colitis	5:156628700-158825698	4040
882	Schizophrenia, Ulcerative Colitis	5:163771582-165642395	2817
883	Schizophrenia, Ulcerative Colitis	5:171074292-172678327	2840
884	Schizophrenia, Ulcerative Colitis	6:10540317-11790816	2102
885	Schizophrenia, Ulcerative Colitis	6:13209388-14802924	2637
886	Schizophrenia, Ulcerative Colitis	6:17386405-19207487	3510
887	Schizophrenia, Ulcerative Colitis	6:50386145-52210476	3058

888	Schizophrenia, Ulcerative Colitis	6:53279102-55468270	4458
889	Schizophrenia, Ulcerative Colitis	6:55468270-56105313	1410
890	Schizophrenia, Ulcerative Colitis	6:63552888-65765742	3468
891	Schizophrenia, Ulcerative Colitis	6:65765742-67329215	3999
892	Schizophrenia, Ulcerative Colitis	6:85209989-87069500	3593
893	Schizophrenia, Ulcerative Colitis	6:106056733-107450306	2753
894	Schizophrenia, Ulcerative Colitis	6:118963115-119963278	1656
895	Schizophrenia, Ulcerative Colitis	6:132765669-134244243	2385
896	Schizophrenia, Ulcerative Colitis	6:137614218-138822629	2182
897	Schizophrenia, Ulcerative Colitis	6:151912703-153094496	2252
898	Schizophrenia, Ulcerative Colitis	7:4573428-5416232	1966
899	Schizophrenia, Ulcerative Colitis	7:9987499-11299198	2938
900	Schizophrenia, Ulcerative Colitis	7:36213538-37555184	2466
901	Schizophrenia, Ulcerative Colitis	7:38966703-39862670	1480
902	Schizophrenia, Ulcerative Colitis	7:42001811-43159074	2105
903	Schizophrenia, Ulcerative Colitis	7:53176312-54222976	2493
904	Schizophrenia, Ulcerative Colitis	7:54222976-55691584	3085
905	Schizophrenia, Ulcerative Colitis	7:93966601-96073508	2883
906	Schizophrenia, Ulcerative Colitis	7:100196651-101199253	1910
907	Schizophrenia, Ulcerative Colitis	7:153674019-154964730	2715
908	Schizophrenia, Ulcerative Colitis	8:5146927-6142797	4101
909	Schizophrenia, Ulcerative Colitis	8:9640787-10463197	2068
910	Schizophrenia, Ulcerative Colitis	8:25483454-26682525	2711
911	Schizophrenia, Ulcerative Colitis	8:32977218-35317232	3368
912	Schizophrenia, Ulcerative Colitis	8:37379389-38938806	1592
913	Schizophrenia, Ulcerative Colitis	8:66489090-69863057	4283
914	Schizophrenia, Ulcerative Colitis	8:81956395-82693739	1065
915	Schizophrenia, Ulcerative Colitis	8:90638162-93554386	3246
916	Schizophrenia, Ulcerative Colitis	8:93554386-95005527	1645
917	Schizophrenia, Ulcerative Colitis	8:108648177-109248173	1052
918	Schizophrenia, Ulcerative Colitis	8:110484314-111850847	1526
919	Schizophrenia, Ulcerative Colitis	8:111850847-113064320	1598
920	Schizophrenia, Ulcerative Colitis	9:7154923-8456299	3530
921	Schizophrenia, Ulcerative Colitis	9:28224283-28811584	1151
922	Schizophrenia, Ulcerative Colitis	9:76203946-76973081	988
923	Schizophrenia, Ulcerative Colitis	9:76973081-78900183	3669
924	Schizophrenia, Ulcerative Colitis	9:117019801-117921960	1625
925	Schizophrenia, Ulcerative Colitis	9:122260297-124871322	3147
926	Schizophrenia, Ulcerative Colitis	9:130055510-132165470	2221
927	Schizophrenia, Ulcerative Colitis	9:133223217-134127888	1580
928	Schizophrenia, Ulcerative Colitis	9:137041122-137589364	1016
929	Schizophrenia, Ulcerative Colitis	9:137589364-138938978	3239
930	Schizophrenia, Ulcerative Colitis	10:7171484-8774665	3748
931	Schizophrenia, Ulcerative Colitis	10:10249396-12586797	4655
932	Schizophrenia, Ulcerative Colitis	10:23175132-25578596	3441
933	Schizophrenia, Ulcerative Colitis	10:29323236-29783692	1224
934	Schizophrenia, Ulcerative Colitis	10:29783692-30458838	1569

935	Schizophrenia, Ulcerative Colitis	10:31907519-33707968	3588
936	Schizophrenia, Ulcerative Colitis	10:53616629-55103572	3467
937	Schizophrenia, Ulcerative Colitis	10:62659679-63341695	702
938	Schizophrenia, Ulcerative Colitis	10:108726686-110317705	3254
939	Schizophrenia, Ulcerative Colitis	10:112561493-115328432	3874
940	Schizophrenia, Ulcerative Colitis	11:15742552-17578402	2642
941	Schizophrenia, Ulcerative Colitis	11:27020461-28481593	1706
942	Schizophrenia, Ulcerative Colitis	11:32276901-33958739	2707
943	Schizophrenia, Ulcerative Colitis	11:33958739-35502605	3407
944	Schizophrenia, Ulcerative Colitis	11:63804569-65898631	2218
945	Schizophrenia, Ulcerative Colitis	11:65898631-68005825	2423
946	Schizophrenia, Ulcerative Colitis	11:108437037-109866116	1682
947	Schizophrenia, Ulcerative Colitis	11:112459488-114257728	3083
948	Schizophrenia, Ulcerative Colitis	11:121175943-122591910	2079
949	Schizophrenia, Ulcerative Colitis	11:126311320-127316679	2113
950	Schizophrenia, Ulcerative Colitis	11:128188537-130342575	3456
951	Schizophrenia, Ulcerative Colitis	11:134205993-134946452	2202
952	Schizophrenia, Ulcerative Colitis	12:1080331-2544786	2391
953	Schizophrenia, Ulcerative Colitis	12:6419753-8377536	2469
954	Schizophrenia, Ulcerative Colitis	12:18087873-20863943	5318
955	Schizophrenia, Ulcerative Colitis	12:23820634-25371083	2911
956	Schizophrenia, Ulcerative Colitis	12:30512406-32165592	3783
957	Schizophrenia, Ulcerative Colitis	12:32165592-33076989	2502
958	Schizophrenia, Ulcerative Colitis	12:51776494-53039004	2427
959	Schizophrenia, Ulcerative Colitis	12:57548860-59308666	2179
960	Schizophrenia, Ulcerative Colitis	12:61123729-64032461	5702
961	Schizophrenia, Ulcerative Colitis	12:67181144-67909729	1252
962	Schizophrenia, Ulcerative Colitis	12:73818454-76511314	4109
963	Schizophrenia, Ulcerative Colitis	12:109025901-110336719	2027
964	Schizophrenia, Ulcerative Colitis	13:38878163-41069263	3727
965	Schizophrenia, Ulcerative Colitis	13:41069263-43101027	3145
966	Schizophrenia, Ulcerative Colitis	13:49383962-51591091	3343
967	Schizophrenia, Ulcerative Colitis	13:65200602-67844453	3837
968	Schizophrenia, Ulcerative Colitis	13:67844453-70724516	5744
969	Schizophrenia, Ulcerative Colitis	13:71526791-73934089	4096
970	Schizophrenia, Ulcerative Colitis	13:85610916-88559882	5699
971	Schizophrenia, Ulcerative Colitis	13:98938919-100574095	3098
972	Schizophrenia, Ulcerative Colitis	13:112247592-113572488	2379
973	Schizophrenia, Ulcerative Colitis	14:26135686-28466533	3690
974	Schizophrenia, Ulcerative Colitis	14:46081896-46749130	1277
975	Schizophrenia, Ulcerative Colitis	14:46749130-48573586	3589
976	Schizophrenia, Ulcerative Colitis	14:65220298-66399555	1808
977	Schizophrenia, Ulcerative Colitis	14:86647002-87635341	1623
978	Schizophrenia, Ulcerative Colitis	14:98341162-99138532	1872
979	Schizophrenia, Ulcerative Colitis	15:31591821-32441811	1299
980	Schizophrenia, Ulcerative Colitis	15:32441811-34015425	2681
981	Schizophrenia, Ulcerative Colitis	15:42776399-44198049	987

982	Schizophrenia, Ulcerative Colitis	15:51677560-53069096	1875
983	Schizophrenia, Ulcerative Colitis	15:55136269-56901773	3541
984	Schizophrenia, Ulcerative Colitis	15:88369943-90475551	3238
985	Schizophrenia, Ulcerative Colitis	15:96141596-98030910	3234
986	Schizophrenia, Ulcerative Colitis	16:14464002-16154060	1539
987	Schizophrenia, Ulcerative Colitis	16:27445755-29036613	1528
988	Schizophrenia, Ulcerative Colitis	16:31382943-46399473	1030
989	Schizophrenia, Ulcerative Colitis	16:60745694-62229849	1875
990	Schizophrenia, Ulcerative Colitis	17:7317398-8306425	1553
991	Schizophrenia, Ulcerative Colitis	17:8306425-9965921	3150
992	Schizophrenia, Ulcerative Colitis	17:34469036-36809344	2504
993	Schizophrenia, Ulcerative Colitis	17:36809344-38877404	2322
994	Schizophrenia, Ulcerative Colitis	17:51826118-53599432	2827
995	Schizophrenia, Ulcerative Colitis	17:55357541-57487512	2674
996	Schizophrenia, Ulcerative Colitis	17:76263413-77298636	2548
997	Schizophrenia, Ulcerative Colitis	18:55213838-56530220	2988
998	Schizophrenia, Ulcerative Colitis	19:18409862-19877471	2049
999	Schizophrenia, Ulcerative Colitis	19:28557893-29790947	2873
1000	Schizophrenia, Ulcerative Colitis	19:57521335-59118839	3067
1001	Schizophrenia, Ulcerative Colitis	20:11249536-12447499	2268
1002	Schizophrenia, Ulcerative Colitis	20:12447499-13689864	2530
1003	Schizophrenia, Ulcerative Colitis	20:15958359-17487232	3552
1004	Schizophrenia, Ulcerative Colitis	20:32813441-34960446	2122
1005	Schizophrenia, Ulcerative Colitis	20:52472549-54055266	2763
1006	Schizophrenia, Ulcerative Colitis	20:56447959-58406572	3177
1007	Schizophrenia, Ulcerative Colitis	21:27271019-29125226	3976
1008	Schizophrenia, Ulcerative Colitis	21:29125226-31197025	3842
1009	Schizophrenia, Ulcerative Colitis	21:32668642-34376999	3128
1010	Schizophrenia, Ulcerative Colitis	22:19912358-22357325	3037
1011	Schizophrenia, Ulcerative Colitis	22:39307894-40545797	1830

Trait 1 - Estimated Local SNPh^2 (Standard Error)	Trait 2 - Estimated Local SNP h^2 (Standard Error)	Local Genetic Correlation (Error)
0.00026 (0.00042)	0.00026 (0.00042)	5e-04 (0.00025)
0.00024 (0.00027)	7e-05 (0.00026)	0.00036 (0.00017)
0.00033 (0.00044)	0.00041 (0.00044)	0.00055 (0.00026)
0.00052 (0.00019)	3e-04 (0.00017)	0.00035 (0.00014)
2e-04 (2e-05)	0.00022 (9e-05)	0.00018 (9e-05)
3e-05 (0.00035)	-4e-05 (0.00034)	-0.00049 (0.00021)
0.00022 (0.00034)	5e-05 (0.00032)	0.00043 (2e-04)
0.00077 (0.00045)	0.00028 (0.00024)	0.00043 (2e-04)
0.00024 (0.00043)	0.00021 (0.00024)	-0.00052 (0.00019)
0.00097 (0.00047)	0.00024 (0.00024)	0.00048 (0.00021)
7e-04 (0.00045)	0.00012 (0.00145)	0.00197 (0.00094)
0.00028 (0.00031)	-3e-04 (NA)	0.00174 (0.00068)
0.00014 (4e-04)	-0.00032 (NA)	0.00177 (0.00085)
9e-05 (0.00037)	-0.00031 (NA)	0.00206 (8e-04)
4e-05 (0.00032)	-6e-05 (NA)	0.00144 (0.00071)
0.00062 (0.00034)	-8e-05 (0.00031)	0.00044 (0.00021)
4e-05 (0.00041)	5e-05 (0.00046)	0.00053 (0.00026)
1e-04 (0.00042)	0.00049 (0.00049)	0.00062 (0.00028)
0.00087 (0.00047)	0.00023 (0.00048)	0.00065 (0.00029)
0.00047 (0.00044)	0.00042 (0.00049)	-0.00058 (0.00029)
0.00051 (0.00047)	0.00026 (0.00102)	0.00095 (0.00046)
0.00037 (0.00041)	0.00021 (0.00086)	0.00083 (0.00041)
0.00024 (5e-04)	0.00141 (0.00128)	0.00114 (0.00052)
-0.00011 (0.00021)	-4e-05 (0.00039)	0.00048 (0.00023)
4e-05 (0.00041)	0.00045 (0.001)	0.00083 (0.00042)
-2e-05 (0.00038)	5e-05 (0.00089)	0.00118 (0.00039)
0.00019 (0.00025)	0.00054 (0.00046)	0.00055 (0.00027)
0.00024 (0.00018)	0.00059 (NA)	0.00042 (0.00021)
3e-05 (0.00038)	-4e-05 (0.00086)	9e-04 (0.00038)
0.00011 (0.00041)	-7e-05 (0.00092)	0.00108 (0.00041)
0.00014 (0.00021)	0.00025 (0.00025)	0.00051 (0.00023)
0.00014 (0.00037)	0.00075 (9e-04)	0.00084 (0.00039)
0.00035 (0.00026)	6e-05 (0.00024)	5e-04 (0.00026)
0.00025 (0.00031)	1e-04 (0.00055)	0.00061 (0.00031)
-4e-05 (0.00036)	0.00025 (0.00086)	0.00082 (0.00037)
7e-05 (0.00032)	0.00015 (0.00068)	0.00068 (0.00033)
-1e-05 (0.00043)	0.00013 (0.00104)	0.00087 (0.00044)
8e-05 (0.00035)	0.00135 (0.00094)	0.00099 (0.00039)
5e-05 (0.00027)	0.00069 (0.00065)	0.00061 (0.00031)
0.00018 (0.00052)	-0.00023 (0.00121)	0.00122 (0.00051)
0.00025 (4e-04)	0.00044 (9e-04)	0.001 (0.00041)
-2e-04 (0.00037)	-7e-05 (0.00091)	0.00087 (0.00038)

1e-05 (0.00038)	0.00028 (0.00091)	0.00093 (0.00039)
0.00019 (0.00027)	0.00023 (0.00047)	0.00057 (0.00028)
5e-05 (0.00044)	-0.00011 (0.00101)	0.00093 (0.00043)
0.00028 (4e-04)	1e-05 (0.00083)	9e-04 (0.00039)
0.00014 (0.00045)	-0.00013 (0.00101)	0.00135 (0.00044)
0.00023 (0.00051)	-6e-05 (0.00117)	0.00121 (5e-04)
-1e-04 (0.00037)	-0.00016 (0.00086)	0.00075 (0.00038)
0.00021 (0.00032)	-2e-05 (0.00058)	8e-04 (0.00032)
7e-05 (0.00061)	0.00037 (0.00079)	0.00099 (0.00046)
0.00029 (0.00046)	0.00139 (0.00056)	8e-04 (4e-04)
0.00012 (6e-04)	0.00289 (0.00096)	0.00109 (0.00051)
0.00045 (0.00064)	0.00025 (0.00077)	0.00104 (0.00047)
0.00014 (0.00062)	0.00066 (0.00081)	0.00113 (0.00047)
0.00015 (0.00062)	0.00035 (0.00078)	0.0011 (0.00046)
-1e-05 (0.00061)	-7e-05 (0.00075)	9e-04 (0.00045)
0.00028 (0.00063)	0.00147 (0.00088)	-0.00099 (0.00049)
1e-04 (0.00061)	0 (0.00075)	0.00098 (0.00045)
0.00037 (0.00061)	0.00042 (0.00075)	0.00092 (0.00046)
0.00055 (0.00064)	0.00157 (0.00088)	-0.00136 (5e-04)
-7e-05 (6e-04)	0.00019 (0.00077)	0.001 (0.00045)
0.00016 (0.00062)	0.00041 (0.00127)	0.00244 (0.00122)
0.00013 (0.00062)	-5e-05 (0.00504)	0.00266 (0.00135)
0.00016 (0.00057)	0.00053 (NA)	0.00225 (0.00113)
0.00035 (0.00063)	0.00128 (0.00084)	0.00117 (0.00049)
6e-04 (0.00065)	0.00057 (0.00079)	0.00126 (0.00049)
0.00032 (0.00063)	7e-04 (0.00079)	0.00138 (0.00048)
0.00023 (0.00044)	3e-05 (0.00044)	0.00071 (0.00036)
0.00055 (0.00064)	0.00142 (0.00085)	-0.00152 (5e-04)
3e-04 (0.00011)	0.00018 (0.00021)	0.00018 (8e-05)
3e-04 (0.00012)	-2e-05 (0.00023)	0.00018 (9e-05)
0.00066 (0.00014)	0.00026 (0.00024)	0.00021 (0.00011)
4e-04 (0.00013)	0.00017 (0.00024)	0.00022 (1e-04)
0.00011 (0.00011)	0.00018 (0.00024)	0.00018 (9e-05)
0.00028 (0.00012)	0.00015 (0.00024)	2e-04 (9e-05)
0.00035 (0.00012)	9e-05 (0.00024)	0.00019 (1e-04)
0.00049 (0.00013)	0.00014 (0.00024)	0.00023 (1e-04)
0.00026 (0.00012)	8e-05 (0.00024)	0.00019 (9e-05)
0.00028 (0.00012)	6e-05 (0.00023)	0.00023 (9e-05)
0.00028 (0.00012)	0.00025 (0.00025)	0.00021 (1e-04)
2e-04 (0.00012)	0.00021 (0.00024)	0.00019 (9e-05)
0.00029 (0.00012)	7e-05 (0.00023)	0.00022 (9e-05)
0.00034 (0.00012)	0.00026 (0.00025)	-0.00022 (1e-04)
0.00052 (0.00013)	0.00015 (0.00022)	0.00029 (1e-04)
0.00024 (0.00012)	8e-05 (0.00022)	-0.00018 (9e-05)
0.00042 (0.00013)	2e-05 (0.00021)	0.00019 (9e-05)
0.00032 (0.00012)	0.00018 (0.00022)	0.00026 (9e-05)

0.00084 (0.00015)	8e-05 (0.00022)	0.00022 (0.00011)
0.00074 (0.00014)	3e-05 (0.00021)	0.00032 (1e-04)
0.00034 (0.00012)	6e-05 (0.00022)	-0.00018 (9e-05)
0.00033 (0.00012)	3e-05 (0.00021)	0.00022 (9e-05)
0.00053 (0.00013)	0.00015 (0.00022)	-0.00025 (1e-04)
0.00014 (0.00011)	0.00024 (0.00022)	-0.00019 (8e-05)
0.00025 (0.00012)	5e-05 (0.00022)	-0.00019 (9e-05)
0.00024 (0.00012)	0.00021 (0.00023)	0.00019 (9e-05)
0.00027 (0.00012)	0.00011 (0.00022)	0.00021 (9e-05)
0.00037 (0.00013)	0.00015 (0.00022)	0.00021 (9e-05)
0.00043 (NA)	0.00111 (0.00064)	0.00186 (0.00082)
0.00053 (0.00018)	0.00053 (8e-04)	0.00043 (2e-04)
0.00051 (0.00018)	0.00026 (0.00078)	0.00059 (2e-04)
0.00048 (0.00018)	0.00033 (0.00078)	0.00054 (2e-04)
0.00081 (2e-04)	0.00012 (0.00077)	0.00051 (0.00022)
0.00055 (0.00019)	0.00014 (0.00077)	4e-04 (2e-04)
0.00011 (0.00016)	0.00038 (0.00079)	0.00036 (0.00016)
0.00039 (0.00018)	0.00013 (0.00077)	0.00044 (0.00019)
0.00028 (0.00017)	6e-05 (0.00076)	-0.00036 (0.00018)
0.00021 (0.00017)	3e-04 (0.00078)	0.00049 (0.00017)
0.00034 (0.00017)	0.00383 (0.00105)	-0.00053 (0.00023)
0.00034 (0.00017)	0.00017 (0.00077)	-0.00037 (0.00018)
0.00025 (0.00017)	3e-05 (0.00076)	0.00045 (0.00017)
0.00065 (0.00018)	-6e-05 (0.00063)	0.00062 (2e-04)
0.00032 (0.00017)	1e-05 (0.00076)	0.00043 (0.00018)
0.00027 (0.00017)	0.00018 (0.00077)	0.00037 (0.00018)
0.00049 (0.00018)	0.00019 (0.00077)	0.00042 (2e-04)
0.00048 (0.00018)	2e-04 (0.00077)	0.00056 (2e-04)
0.00053 (0.00018)	0.00027 (0.00078)	0.00042 (2e-04)
0.00024 (0.00017)	0.00026 (0.00078)	0.00035 (0.00018)
5e-04 (0.00018)	2e-05 (0.00076)	0.00039 (2e-04)
0.00021 (0.00017)	0.00025 (0.00078)	0.00048 (0.00017)
0.00025 (0.00017)	0.00033 (0.00078)	0.00038 (0.00018)
0.00059 (0.00019)	0.00012 (0.00077)	-0.00045 (2e-04)
0.00034 (0.00017)	0.00037 (0.00079)	0.00061 (0.00019)
0.00042 (0.00018)	4e-05 (0.00076)	0.00041 (0.00019)
0.00023 (0.00014)	2e-04 (0.00042)	0.00029 (0.00015)
0.00052 (0.00018)	0.00037 (0.00079)	0.00063 (2e-04)
0.00089 (2e-04)	0.00044 (0.00079)	0.00075 (0.00023)
0.00019 (0.00016)	-8e-05 (0.00075)	-0.00054 (0.00017)
0.00036 (0.00015)	0.00025 (5e-04)	-4e-04 (0.00017)
0.00038 (0.00018)	0.00011 (0.00076)	0.00043 (0.00019)
0.00017 (0.00013)	3e-05 (0.00037)	0.00037 (0.00014)
4e-05 (0.00016)	7e-05 (0.00076)	-0.00032 (0.00015)
0.00015 (0.00016)	0.00028 (0.00078)	0.00035 (0.00017)
0.00074 (2e-04)	-9e-05 (0.00075)	0.00067 (0.00021)
0.00088 (0.00019)	0.00114 (0.00076)	6e-04 (0.00023)

0.00014 (0.00016)	4e-05 (0.00076)	0.00059 (0.00016)
0.00014 (0.00016)	0.00016 (0.00077)	-0.00048 (0.00017)
0.00023 (0.00017)	0.00031 (0.00078)	0.00036 (0.00018)
0.00016 (0.00016)	-1e-04 (0.00075)	-0.00032 (0.00016)
0.00041 (0.00018)	0.00027 (0.00078)	0.00041 (0.00019)
0.00031 (0.00017)	0.00023 (0.00078)	0.00061 (0.00018)
0.00031 (0.00017)	1e-04 (0.00076)	0.00059 (0.00018)
0.00034 (0.00014)	0.00139 (0.00056)	0.00066 (0.00018)
0.00036 (0.00018)	0.00025 (0.00078)	0.00055 (0.00019)
0.00023 (0.00017)	2e-04 (0.00077)	-0.00058 (0.00017)
9e-05 (0.00016)	0.00017 (0.00077)	0.00039 (0.00016)
0.00031 (0.00017)	6e-05 (0.00076)	0.00084 (0.00018)
0.00019 (0.00017)	0.00042 (0.00079)	-0.00036 (0.00017)
0.00026 (0.00017)	-4e-05 (0.00075)	0.00056 (0.00017)
0.00061 (0.00019)	-2e-05 (0.00075)	5e-04 (2e-04)
0.00059 (0.00019)	0.00017 (0.00077)	0.00053 (2e-04)
0.00038 (0.00018)	0.00025 (0.00078)	0.00066 (0.00019)
0.00022 (0.00014)	0.00029 (0.00048)	0.00032 (0.00015)
0.00025 (0.00017)	0.00017 (0.00077)	-0.00036 (0.00018)
0.00019 (0.00016)	-7e-05 (0.00075)	5e-04 (0.00017)
0.00023 (0.00017)	-8e-05 (0.00075)	0.00041 (0.00017)
0.00044 (0.00018)	-1e-05 (0.00075)	0.00041 (0.00019)
0.00024 (0.00017)	0.00013 (0.00077)	0.00036 (0.00017)
0.00039 (0.00018)	3e-05 (0.00076)	-4e-04 (0.00019)
0.00021 (0.00017)	0.00022 (0.00077)	0.00042 (0.00017)
0.00059 (0.00019)	0.00013 (0.00077)	0.00047 (2e-04)
0.00087 (2e-04)	0.00043 (0.00079)	0.00111 (0.00023)
0.00034 (0.00017)	1e-05 (0.00076)	-0.00046 (0.00018)
0.00026 (0.00014)	0.00018 (0.00049)	0.00032 (0.00016)
0.00045 (0.00018)	0.00119 (0.00086)	0.00068 (0.00021)
0.00023 (0.00015)	4e-05 (0.00053)	0.00038 (0.00016)
0.00036 (0.00017)	-3e-05 (0.00075)	0.00056 (0.00018)
5e-05 (0.00016)	0.00013 (0.00077)	3e-04 (0.00016)
5e-05 (0.00016)	-2e-05 (0.00075)	0.00041 (0.00015)
0.00022 (0.00017)	-5e-05 (0.00075)	0.00036 (0.00017)
0.00029 (0.00017)	-7e-05 (0.00075)	0.00035 (0.00018)
0.00026 (0.00017)	6e-05 (0.00076)	-0.00036 (0.00017)
0.00029 (0.00017)	-6e-05 (0.00075)	0.00047 (0.00018)
1e-04 (0.00016)	-3e-05 (0.00075)	0.00054 (0.00016)
0.00012 (0.00016)	-2e-05 (0.00075)	-0.00036 (0.00016)
0.00092 (2e-04)	-5e-05 (0.00075)	-0.00092 (0.00023)
6e-05 (0.00016)	7e-05 (0.00076)	0.00041 (0.00015)
0.00043 (0.00018)	0.00014 (0.00077)	0.00052 (0.00019)
0.00081 (2e-04)	0.00039 (0.00079)	7e-04 (0.00022)
0.00033 (0.00017)	2e-05 (0.00076)	0.00044 (0.00018)
0.00048 (0.00018)	0.00012 (0.00077)	0.00061 (2e-04)
0.00041 (0.00018)	6e-05 (0.00076)	0.00037 (0.00019)

0.00036 (0.00017)	0.00221 (0.00094)	-0.00055 (0.00021)
0.00029 (0.00017)	0.00026 (0.00078)	0.00037 (0.00018)
8e-05 (0.00016)	1e-04 (0.00076)	0.00039 (0.00016)
0.00074 (2e-04)	9e-05 (0.00076)	0.00057 (0.00022)
0.00043 (0.00016)	0 (0.00055)	0.00036 (0.00018)
0.00066 (0.00019)	-8e-05 (0.00075)	0.00068 (0.00021)
0.00051 (0.00018)	0.00117 (0.00085)	0.00107 (0.00021)
0.00056 (0.00018)	-2e-05 (0.00072)	-4e-04 (2e-04)
0.00062 (0.00019)	0.00066 (0.00081)	0.00057 (0.00021)
0.00033 (0.00017)	0.00035 (0.00079)	0.00055 (0.00019)
0.00019 (0.00016)	-0.00017 (0.00074)	-0.00042 (0.00016)
0.00029 (0.00017)	-1e-04 (0.00074)	0.00044 (0.00018)
0.00019 (0.00016)	0.00076 (0.00082)	0.00045 (0.00018)
0.00028 (0.00017)	-4e-05 (0.00075)	0.00042 (0.00018)
0.00026 (0.00017)	0.00244 (0.00095)	-0.00057 (0.00021)
0.00023 (0.00017)	0.00051 (8e-04)	0.00041 (0.00018)
9e-04 (2e-04)	2e-05 (0.00076)	0.00065 (0.00023)
0.00037 (0.00018)	1e-05 (0.00076)	0.00078 (0.00018)
6e-04 (0.00019)	-0.00012 (0.00074)	5e-04 (2e-04)
0.00015 (0.00016)	0.00016 (0.00076)	4e-04 (0.00017)
0.00026 (0.00017)	0.00018 (0.00077)	0.00048 (0.00018)
0.00026 (0.00017)	0.00029 (0.00078)	0.00045 (0.00018)
0.00035 (0.00017)	3e-05 (0.00076)	0.00038 (0.00018)
0.00034 (0.00017)	0.00014 (0.00077)	0.00046 (0.00018)
0.00043 (0.00018)	8e-05 (0.00076)	0.00044 (0.00019)
0.00027 (0.00017)	-6e-05 (0.00075)	-0.00058 (0.00017)
0.00039 (0.00018)	5e-05 (0.00076)	0.00037 (0.00019)
0.00054 (0.00019)	2e-04 (0.00077)	0.00052 (2e-04)
0.00057 (0.00019)	0.00065 (0.00081)	0.00076 (0.00021)
0.00087 (2e-04)	-9e-05 (0.00075)	5e-04 (0.00022)
0.00039 (0.00018)	1e-05 (0.00076)	0.00048 (0.00019)
0.00053 (0.00018)	-0.00012 (0.00074)	0.00044 (2e-04)
0.00022 (0.00017)	3e-05 (0.00076)	0.00034 (0.00017)
0.00037 (0.00018)	0.00016 (0.00077)	0.00045 (0.00019)
5e-04 (0.00018)	-6e-05 (0.00075)	0.00042 (0.00019)
0.00019 (0.00016)	0.00016 (0.00071)	0.00042 (0.00017)
0.00086 (2e-04)	9e-05 (0.00076)	0.00063 (0.00022)
0.00041 (0.00017)	0.00062 (0.00071)	0.00039 (0.00019)
7e-04 (0.00017)	0.00068 (0.00054)	0.00043 (2e-04)
0.00069 (0.00019)	-1e-04 (0.00075)	0.00042 (0.00021)
0.00022 (0.00017)	7e-05 (0.00076)	0.00044 (0.00017)
0.00017 (0.00016)	-7e-05 (0.00075)	0.00062 (0.00016)
0.00024 (0.00017)	0.00021 (0.00077)	-0.00042 (0.00018)
4e-04 (0.00018)	0.00041 (0.00079)	4e-04 (0.00019)
0.00023 (0.00017)	-6e-05 (0.00075)	-0.00038 (0.00017)
0.00024 (0.00017)	0.00088 (0.00083)	-0.00064 (0.00018)
0.00039 (0.00018)	8e-05 (0.00076)	0.00073 (0.00019)

0.00035 (0.00017)	0.00011 (0.00076)	0.00045 (0.00018)
0.00057 (0.00019)	8e-05 (0.00076)	0.00049 (2e-04)
0.00027 (0.00017)	0.00037 (0.00079)	0.00038 (0.00018)
0.00035 (0.00016)	7e-05 (0.00054)	-0.00035 (0.00017)
0.00041 (0.00018)	-1e-05 (0.00075)	0.00045 (0.00019)
0.00037 (0.00018)	0.00101 (0.00084)	0.00055 (2e-04)
7e-04 (0.00019)	0.00032 (0.00078)	0.00078 (0.00022)
0.00028 (0.00017)	-1e-04 (0.00075)	4e-04 (0.00017)
0.00044 (0.00018)	1e-04 (0.00074)	0.00042 (0.00019)
0.00031 (0.00017)	0.00025 (0.00078)	0.00044 (0.00018)
0.00019 (0.00016)	0.00133 (0.00087)	0.00061 (0.00019)
0.00071 (0.00019)	-5e-05 (0.00075)	0.00054 (0.00021)
0.00057 (0.00019)	0.00086 (0.00083)	-0.00059 (0.00021)
0.00039 (0.00018)	4e-05 (0.00076)	0.00038 (0.00019)
0.00033 (0.00017)	0.00015 (0.00077)	0.00044 (0.00018)
0.00016 (0.00016)	8e-05 (0.00076)	0.00035 (0.00017)
0.00038 (0.00018)	0.00018 (0.00077)	0.00039 (0.00019)
2e-04 (0.00017)	5e-05 (0.00076)	-0.00044 (0.00017)
0.00057 (0.00019)	1e-04 (0.00076)	4e-04 (2e-04)
0.00057 (0.00019)	0.00038 (0.00079)	0.00059 (0.00021)
0.00021 (0.00017)	0.00157 (0.00089)	0.00039 (0.00019)
0.00039 (0.00018)	7e-05 (0.00076)	0.00056 (0.00019)
0.00083 (2e-04)	0.00147 (0.00088)	-0.00095 (0.00024)
0.00061 (0.00019)	0.00015 (0.00077)	0.00043 (0.00021)
0.00035 (0.00012)	2e-05 (NA)	3e-04 (0.00014)
0.00048 (0.00018)	-1e-04 (0.00075)	6e-04 (0.00019)
0.00019 (0.00016)	0.00015 (0.00077)	0.00036 (0.00017)
0.00028 (0.00017)	7e-05 (0.00076)	-0.00037 (0.00018)
0.00043 (0.00018)	0.00021 (0.00077)	0.00045 (0.00019)
0.00067 (0.00019)	0.00077 (0.00082)	0.00046 (0.00022)
0.00054 (0.00019)	0.00015 (0.00077)	0.00058 (2e-04)
0.00047 (0.00018)	-7e-05 (0.00075)	4e-04 (0.00019)
0.00018 (9e-05)	-2e-05 (NA)	0.00022 (0.00011)
0.00024 (0.00017)	0.00123 (0.00086)	0.00041 (0.00019)
0.00041 (0.00017)	2e-05 (0.00072)	0.00045 (0.00019)
0.00036 (0.00018)	0 (0.00075)	0.00045 (0.00018)
0.00074 (2e-04)	0.00033 (0.00078)	0.00075 (0.00022)
0.00011 (0.00013)	0.00044 (0.00048)	0.00034 (0.00014)
0.00057 (0.00019)	-6e-05 (0.00075)	-0.00051 (2e-04)
0.00049 (0.00018)	4e-04 (0.00079)	0.00051 (2e-04)
0.00057 (0.00019)	-0.00011 (0.00074)	0.00074 (2e-04)
0.00069 (0.00019)	3e-04 (0.00078)	0.00065 (0.00021)
0.0013 (0.00022)	0.00038 (0.00079)	6e-04 (0.00026)
0.00019 (0.00016)	0.00035 (0.00079)	-0.00052 (0.00017)
0.00034 (0.00017)	3e-05 (0.00076)	0.00064 (0.00018)
0.00038 (0.00018)	0.00043 (0.00079)	-4e-04 (0.00019)
0.00041 (0.00018)	-7e-05 (0.00075)	0.00049 (0.00019)

3e-04 (0.00017)	0.00052 (8e-04)	0.00063 (0.00018)
0.00023 (0.00016)	0.00028 (0.00066)	0.00041 (0.00017)
0.00072 (2e-04)	0.00046 (8e-04)	-0.00078 (0.00022)
0.00033 (0.00017)	0.00035 (0.00079)	6e-04 (0.00019)
0.00029 (0.00017)	0 (0.00073)	0.00053 (0.00017)
0.00039 (0.00018)	0 (0.00076)	0.00047 (0.00019)
0.00016 (0.00016)	0 (0.00075)	0.00039 (0.00016)
0.00023 (0.00017)	-0.00014 (0.00074)	0.00039 (0.00017)
0.00034 (0.00017)	0.00011 (0.00076)	-0.00044 (0.00018)
0.00037 (0.00017)	-0.00011 (7e-04)	0.00042 (0.00018)
0.00048 (0.00018)	0.00164 (0.00089)	0.00097 (0.00021)
0.00045 (0.00018)	0.00069 (0.00082)	6e-04 (2e-04)
0.00023 (0.00017)	6e-05 (0.00076)	-0.00037 (0.00017)
0.00016 (0.00016)	-3e-05 (0.00075)	0.00036 (0.00016)
0.00037 (0.00018)	0 (0.00076)	0.00041 (0.00018)
7e-04 (0.00019)	-0.00012 (0.00074)	0.00044 (0.00021)
0.00046 (0.00018)	0.00032 (0.00078)	0.00052 (2e-04)
0.00038 (0.00018)	0.00065 (0.00081)	0.00041 (0.00019)
0.00046 (0.00018)	0.00016 (0.00077)	0.00038 (0.00019)
0.00045 (0.00018)	-0.00014 (0.00074)	0.00048 (0.00019)
0.00016 (0.00016)	0.00029 (0.00078)	0.00065 (0.00017)
0.00041 (0.00018)	0.00011 (0.00076)	-0.00047 (0.00019)
0.00024 (0.00017)	0.00012 (0.00077)	0.00035 (0.00017)
0.00033 (0.00017)	0.00048 (8e-04)	-0.00045 (0.00019)
0.00039 (0.00018)	1e-04 (0.00076)	0.00038 (0.00019)
6e-04 (0.00016)	0.00028 (0.00048)	-0.00038 (0.00019)
0.00055 (0.00019)	0.00036 (0.00079)	0.00046 (2e-04)
0.00086 (2e-04)	0.00024 (0.00078)	0.00052 (0.00023)
0.00063 (0.00019)	0.00065 (0.00081)	0.00081 (0.00021)
0.00068 (0.00019)	1e-05 (0.00076)	0.00048 (0.00021)
0.00035 (0.00017)	2e-04 (0.00077)	-0.00036 (0.00019)
0.00028 (0.00017)	2e-04 (0.00077)	0.00037 (0.00018)
0.00045 (0.00018)	6e-05 (0.00076)	0.00038 (0.00019)
0.00026 (0.00017)	-3e-05 (0.00075)	0.00064 (0.00017)
0.00015 (0.00016)	0.00064 (0.00081)	0.00051 (0.00017)
0.00027 (0.00017)	0.00169 (9e-04)	0.00052 (2e-04)
0.00031 (0.00017)	0.00012 (0.00075)	0.00035 (0.00018)
0.00023 (0.00017)	0.00143 (0.00088)	0.00039 (0.00019)
0.00053 (0.00018)	2e-05 (0.00076)	0.00049 (2e-04)
0.00066 (0.00019)	0.00157 (0.00089)	-0.00046 (0.00023)
0.00067 (0.00019)	0.00053 (8e-04)	0.00068 (0.00022)
0.00053 (0.00018)	0.00029 (0.00078)	4e-04 (2e-04)
2e-04 (0.00017)	-0.00012 (0.00074)	0.00036 (0.00017)
0.00052 (0.00018)	7e-05 (0.00076)	0.00062 (2e-04)
0.00029 (0.00017)	5e-04 (8e-04)	0.00056 (0.00018)
0.00019 (0.00016)	-3e-05 (0.00075)	0.00038 (0.00017)
0.00036 (0.00018)	2e-05 (0.00076)	-4e-04 (0.00018)

0.00055 (0.00019)	1e-04 (0.00076)	0.00045 (2e-04)
0.00078 (2e-04)	0 (0.00075)	0.00062 (0.00022)
0.00014 (0.00015)	-1e-05 (0.00061)	0.00038 (0.00015)
0.00019 (0.00016)	6e-04 (0.00081)	-0.00044 (0.00018)
0.00023 (0.00017)	0.00054 (8e-04)	0.00054 (0.00018)
8e-05 (0.00013)	7e-05 (0.00052)	0.00033 (0.00014)
0.00026 (0.00017)	1e-05 (0.00076)	0.00037 (0.00017)
0.00052 (0.00018)	0.00048 (8e-04)	6e-04 (2e-04)
0.00023 (0.00017)	0.00029 (0.00078)	0.00064 (0.00018)
8e-05 (0.00016)	0.00014 (0.00077)	0.00036 (0.00016)
4e-04 (0.00018)	2e-05 (0.00076)	-0.00045 (0.00019)
0.00024 (0.00017)	4e-05 (0.00076)	0.00048 (0.00017)
0.00027 (0.00017)	0.00038 (0.00079)	0.00048 (0.00018)
0.00029 (0.00017)	0.00027 (0.00078)	0.00051 (0.00018)
0.00042 (0.00018)	0.00023 (0.00078)	0.00049 (0.00019)
5e-04 (0.00018)	0.00028 (0.00078)	0.00042 (2e-04)
0.00044 (0.00018)	1e-04 (0.00076)	-0.00045 (0.00019)
0.00027 (0.00017)	0.00132 (0.00087)	0.00069 (0.00019)
0.00025 (0.00017)	0.00013 (0.00077)	-4e-04 (0.00018)
0.00039 (0.00018)	1e-04 (0.00076)	0.00084 (0.00019)
0.00025 (0.00017)	0.00019 (0.00077)	9e-04 (0.00018)
0.00035 (0.00017)	5e-05 (0.00076)	-0.00038 (0.00018)
0.00063 (0.00019)	0.00026 (0.00078)	0.00041 (0.00021)
0.00011 (0.00016)	0.00015 (0.00077)	0.00038 (0.00016)
0.00025 (0.00017)	4e-05 (0.00076)	0.00043 (0.00017)
0.00137 (0.00023)	0.00079 (0.00082)	0.00072 (0.00027)
0.00054 (0.00019)	0.00019 (0.00077)	0.00072 (2e-04)
0.00049 (0.00017)	0.00096 (0.00119)	0.00068 (0.00027)
0.00011 (0.00014)	0.00063 (0.00104)	0.00051 (0.00022)
0.00033 (0.00015)	3e-05 (0.00069)	0.00101 (0.00023)
0.00087 (2e-04)	0.00017 (0.00141)	0.00113 (0.00032)
0.00038 (0.00013)	5e-05 (NA)	0.00047 (0.00022)
0.00017 (0.00013)	0.00077 (0.00056)	-0.00042 (2e-04)
0.00057 (0.00018)	-0.00021 (0.00137)	0.00085 (0.00029)
0.00032 (0.00016)	2e-04 (0.0012)	0.00068 (0.00025)
0.00136 (0.00022)	0.00014 (0.00115)	-0.00073 (0.00036)
0.00029 (0.00012)	0.00046 (NA)	0.00044 (2e-04)
0.00035 (0.00015)	-0.00012 (7e-04)	0.00055 (0.00023)
0.00031 (0.00017)	-8e-05 (0.00139)	0.00052 (0.00026)
0.00063 (0.00019)	0.00023 (0.00142)	0.00061 (3e-04)
0.00013 (0.00015)	0.00195 (0.00146)	0.00054 (0.00025)
0.00034 (0.00015)	0.00029 (8e-04)	0.00056 (0.00024)
0.00053 (0.00018)	0.00101 (0.00147)	0.00087 (0.00029)
0.00064 (0.00018)	-0.00016 (0.00109)	0.0011 (0.00028)
4e-04 (0.00016)	0.00026 (0.00091)	0.00053 (0.00025)
0.00059 (0.00019)	0.00012 (0.00141)	0.00102 (0.00029)
0.00025 (0.00017)	0.00038 (0.00139)	0.00069 (0.00025)

0.00054 (0.00017)	2e-05 (0.0011)	0.00056 (0.00027)
0.00028 (0.00011)	0.00025 (NA)	0.00038 (0.00019)
0.00035 (0.00016)	-8e-05 (0.00116)	0.00054 (0.00025)
0.00052 (0.00018)	5e-05 (0.0014)	0.00066 (0.00028)
0.00047 (0.00018)	0.00023 (0.00142)	0.00063 (0.00028)
0.00055 (0.00018)	0.00069 (0.00133)	-6e-04 (0.00029)
0.00038 (0.00017)	-0.00016 (0.00138)	0.00056 (0.00027)
0.00082 (2e-04)	0.00032 (0.00143)	0.00078 (0.00032)
9e-05 (0.00013)	0.00042 (0.00091)	0.00055 (2e-04)
0.00023 (0.00014)	-5e-05 (0.00056)	0.00078 (0.00021)
0.00041 (0.00018)	0.00035 (0.00143)	0.00078 (0.00027)
0.00027 (0.00011)	-0.00019 (NA)	0.00037 (0.00018)
0.00091 (0.00018)	0.00066 (0.00082)	0.00113 (3e-04)
0.00034 (0.00017)	-8e-05 (0.00139)	0.00052 (0.00026)
0.00036 (0.00016)	0.00012 (0.00112)	0.00066 (0.00025)
0.00041 (0.00015)	0.00034 (0.00086)	-0.00072 (0.00025)
0.00066 (0.00016)	0.00035 (0.00017)	0.00056 (0.00026)
9e-04 (0.00016)	0.00043 (NA)	-0.00062 (0.00028)
0.00022 (0.00012)	0.00021 (NA)	0.00057 (0.00019)
0.00085 (0.00018)	-0.00013 (0.00057)	0.00093 (0.00029)
0.00023 (0.00014)	0 (0.00074)	0.00046 (0.00022)
0.00032 (0.00017)	0.00018 (0.00141)	0.00079 (0.00026)
0.00026 (0.00016)	-0.00011 (0.00112)	0.00063 (0.00024)
0.00073 (0.00018)	0.00159 (0.00113)	0.00114 (3e-04)
0.00037 (0.00015)	0.00034 (0.00073)	0.00078 (0.00024)
0.00035 (0.00014)	-9e-05 (NA)	5e-04 (0.00022)
0.00066 (0.00019)	4e-05 (0.0013)	0.00071 (0.00029)
0.00029 (0.00015)	3e-05 (0.001)	0.00049 (0.00024)
0.00053 (0.00018)	0.00025 (0.00142)	6e-04 (0.00029)
0.00053 (0.00018)	-2e-05 (0.00139)	0.00087 (0.00028)
0.00023 (0.00014)	0 (0.00089)	0.00058 (0.00022)
2e-04 (0.00012)	-2e-04 (NA)	0.00051 (0.00019)
0.00035 (0.00015)	0.00027 (0.00098)	0.00071 (0.00024)
0.00048 (0.00018)	0.00051 (0.00144)	0.00061 (0.00028)
0.00039 (0.00015)	0.00022 (0.00058)	0.00059 (0.00023)
0.00021 (0.00014)	0.00046 (0.00095)	0.00063 (0.00022)
2e-04 (0.00013)	-0.00015 (0.00038)	0.00045 (2e-04)
0.00028 (0.00013)	2e-05 (NA)	-0.00042 (2e-04)
0.00039 (0.00015)	-5e-05 (0.00061)	0.00063 (0.00023)
0.00046 (0.00017)	-0.00021 (0.00117)	0.00052 (0.00026)
0.00037 (0.00014)	-0.00011 (0.00023)	0.00064 (0.00022)
0.00028 (0.00012)	0.00166 (NA)	0.00075 (0.00022)
0.00035 (0.00014)	-0.00014 (4e-04)	-0.00056 (0.00022)
0.00029 (0.00015)	-1e-05 (0.00098)	0.00051 (0.00023)
0.00041 (0.00013)	0 (NA)	0.00044 (0.00022)
0.00067 (0.00017)	-0.00012 (0.00084)	0.00056 (0.00028)
0.00021 (0.00015)	0.00173 (0.00136)	0.00076 (0.00025)

0.00047 (0.00018)	2e-05 (0.00134)	6e-04 (0.00028)
0.00088 (2e-04)	0.00044 (0.00144)	0.00082 (0.00032)
0.00071 (0.00017)	0.00296 (0.00113)	0.00067 (3e-04)
0.00025 (0.00017)	2e-05 (0.0014)	0.00053 (0.00025)
0.00034 (0.00014)	-0.00022 (0.00038)	0.00071 (0.00022)
0.00022 (0.00015)	-0.00016 (0.00108)	0.00054 (0.00023)
0.00044 (0.00016)	-9e-05 (0.00091)	6e-04 (0.00025)
0.00036 (0.00014)	7e-05 (0.00046)	0.00047 (0.00023)
0.00043 (0.00016)	0.00016 (0.00084)	0.00051 (0.00025)
0.00039 (0.00017)	-1e-04 (0.00139)	-0.00055 (0.00027)
0.00049 (0.00014)	0.00051 (NA)	0.00064 (0.00024)
0.00021 (0.00015)	-1e-04 (0.00098)	0.00061 (0.00022)
0.00036 (0.00017)	7e-05 (0.0014)	0.00077 (0.00027)
0.00018 (0.00015)	-0.00013 (0.00118)	0.00081 (0.00023)
0.00033 (0.00013)	0.00024 (NA)	0.00064 (0.00021)
3e-04 (0.00017)	0.00022 (0.0014)	0.00059 (0.00026)
0.00018 (0.00013)	-0.00018 (0.00023)	0.00066 (0.00019)
0.00043 (0.00018)	8e-05 (0.0014)	0.00064 (0.00027)
0.00018 (0.00013)	-2e-04 (0.00046)	4e-04 (2e-04)
0.00012 (0.00014)	0.00022 (9e-04)	0.00042 (0.00021)
0.00026 (0.00017)	0.00021 (0.00142)	0.00083 (0.00025)
0.00069 (0.00016)	0.00032 (0.00055)	0.00092 (0.00027)
0.00023 (0.00011)	0.00014 (NA)	-0.00038 (0.00018)
0.00054 (0.00018)	-5e-05 (0.00128)	0.00072 (0.00028)
0.00043 (0.00016)	-0.00011 (0.00101)	0.00053 (0.00025)
0.00031 (0.00017)	-0.00012 (0.00138)	0.00073 (0.00026)
0.00034 (0.00015)	-2e-05 (0.00083)	0.00085 (0.00023)
0.00052 (0.00017)	-0.00018 (0.00106)	-0.00073 (0.00027)
0.00043 (0.00018)	-1e-04 (0.00139)	0.00077 (0.00027)
0.00053 (0.00017)	4e-05 (0.00116)	0.00065 (0.00027)
0.00035 (0.00015)	4e-05 (0.00092)	0.00081 (0.00024)
0.00018 (0.00016)	-0.00012 (0.00128)	-6e-04 (0.00024)
0.00018 (8e-05)	0.00071 (NA)	0.00032 (0.00015)
7e-04 (0.00018)	-0.00013 (0.00102)	0.00058 (0.00028)
0.00026 (0.00013)	3e-05 (NA)	0.00044 (2e-04)
0.00055 (0.00014)	-4e-05 (NA)	0.00057 (0.00023)
0.00018 (7e-05)	0.00039 (NA)	0.00029 (0.00013)
0.00025 (0.00017)	-0.00022 (0.00136)	0.00118 (0.00025)
0.00034 (0.00014)	0.00021 (0.00064)	0.00062 (0.00023)
0.00029 (0.00013)	1e-04 (NA)	0.00045 (2e-04)
3e-04 (0.00013)	0.00014 (NA)	0.00047 (2e-04)
0.00032 (0.00015)	-0.00011 (0.00071)	0.00046 (0.00023)
5e-04 (0.00016)	2e-05 (0.00065)	0.00103 (0.00025)
0.00024 (0.00014)	9e-05 (0.00066)	0.00046 (0.00021)
0.00018 (0.00014)	0.00024 (0.00081)	0.00082 (0.00021)
0.00018 (0.00013)	0.00032 (0.00046)	0.00052 (2e-04)
0.00063 (0.00019)	0.00035 (0.00143)	0.00059 (3e-04)

0.00027 (0.00012)	-0.00011 (NA)	-0.00047 (0.00019)
0.00063 (0.00019)	-5e-05 (0.00139)	0.00069 (0.00029)
0.00054 (0.00013)	0.00035 (NA)	0.00045 (0.00022)
0.00041 (0.00018)	1e-04 (0.00141)	0.00068 (0.00027)
0.00015 (0.00013)	-3e-05 (0.00054)	0.00044 (2e-04)
0.00035 (0.00017)	5e-04 (0.00127)	0.00065 (0.00026)
7e-04 (0.00018)	0.00017 (0.00111)	-0.00091 (0.00029)
0.00047 (0.00015)	0.00047 (0.00059)	0.00054 (0.00025)
0.00022 (0.00015)	2e-05 (0.00117)	0.00059 (0.00024)
0.00036 (0.00017)	0.00016 (0.00125)	0.00066 (0.00026)
0.00032 (0.00015)	-8e-05 (0.00095)	0.00047 (0.00024)
0.00046 (0.00018)	-0.00023 (0.00137)	0.00078 (0.00027)
0.00036 (0.00016)	-0.00018 (0.00105)	-0.00057 (0.00025)
0.00045 (0.00018)	0.00049 (0.00144)	0.00056 (0.00028)
0.00044 (0.00013)	0.00019 (NA)	0.00049 (0.00022)
0.00061 (0.00018)	0.00014 (0.00135)	0.00067 (0.00029)
0.00061 (0.00019)	0.00021 (0.00142)	0.00153 (0.00029)
0.00046 (0.00011)	0.00066 (NA)	0.00056 (2e-04)
0.00011 (0.00012)	0.00027 (0.00031)	0.00053 (0.00019)
0.00018 (0.00013)	8e-05 (0.00048)	0.00046 (2e-04)
0.00037 (0.00017)	-5e-05 (0.00139)	0.00053 (0.00027)
0.00028 (0.00014)	0.00016 (0.00069)	0.00048 (0.00022)
0.00038 (0.00017)	0.00016 (0.00141)	0.00076 (0.00027)
0.00051 (0.00016)	-0.00013 (0.00085)	0.00051 (0.00026)
0.00045 (0.00018)	0.00048 (0.00144)	0.00065 (0.00028)
4e-04 (0.00017)	-5e-05 (0.00139)	-0.00095 (0.00027)
0.00034 (0.00016)	0.00033 (0.00124)	0.00062 (0.00025)
0.00034 (9e-05)	7e-05 (NA)	0.00037 (0.00017)
2e-04 (0.00016)	0.00035 (0.00143)	0.00065 (0.00025)
0.00025 (0.00017)	0 (0.0014)	0.00062 (0.00025)
0.00074 (0.00016)	1e-04 (3e-04)	0.0011 (0.00027)
0.00031 (0.00017)	-7e-05 (0.00139)	0.00055 (0.00026)
0.00041 (0.00018)	4e-04 (0.00143)	0.00092 (0.00027)
0.00037 (0.00017)	-3e-05 (0.00129)	0.00064 (0.00026)
0.00097 (2e-04)	0.00032 (0.00115)	0.00174 (0.00032)
0.00027 (0.00017)	0.00052 (0.00144)	0.00085 (0.00026)
0.00042 (0.00017)	0.00018 (0.00133)	0.00057 (0.00027)
0.00031 (0.00013)	4e-05 (NA)	0.00045 (2e-04)
0.00033 (0.00013)	-0.00014 (NA)	0.00061 (0.00021)
0.00013 (0.00012)	0.00032 (0.00051)	0.00039 (0.00019)
0.00048 (0.00017)	8e-05 (0.00108)	0.00081 (0.00026)
6e-05 (0.00015)	-0.00015 (0.00138)	0.00056 (0.00022)
5e-04 (0.00018)	0.00069 (0.00146)	0.00069 (0.00029)
0.00042 (0.00014)	-0.00017 (NA)	0.00079 (0.00023)
5e-04 (0.00017)	-9e-05 (0.00115)	0.00062 (0.00027)
4e-04 (0.00014)	-3e-05 (4e-04)	0.00052 (0.00023)
0.00043 (0.00018)	-0.00011 (0.00138)	0.00076 (0.00027)

0.00021 (0.00014)	-0.00012 (0.00069)	0.00056 (0.00021)
0.00064 (0.00018)	0.00169 (0.00128)	0.00097 (3e-04)
0.00032 (0.00016)	-9e-05 (0.00104)	0.00087 (0.00024)
0.00056 (0.00018)	-0.00011 (0.00138)	0.00073 (0.00029)
0.00038 (0.00017)	7e-05 (0.0014)	-0.00067 (0.00027)
0.00032 (0.00013)	6e-05 (NA)	0.00042 (2e-04)
3e-04 (0.00016)	0.00045 (0.00112)	0.00049 (0.00024)
0.00083 (0.00019)	4e-05 (0.00127)	0.00064 (0.00031)
0.00042 (0.00017)	-0.00014 (0.00126)	0.00076 (0.00026)
0.00027 (0.00014)	-1e-05 (0.00054)	0.00051 (0.00022)
0.00021 (0.00014)	2e-05 (0.00089)	0.00064 (0.00022)
1e-04 (0.00012)	2e-05 (0.00024)	0.00055 (0.00018)
0.00067 (0.00019)	-3e-05 (0.00139)	0.00059 (3e-04)
3e-04 (0.00011)	0.00029 (NA)	0.00041 (0.00019)
0.00058 (0.00017)	0.00018 (0.00106)	0.00063 (0.00028)
0.00055 (0.00018)	-0.00022 (0.00137)	-0.00056 (0.00028)
0.00127 (0.00022)	0.00088 (0.00148)	0.00077 (0.00036)
0.00041 (0.00018)	1e-05 (0.0014)	-0.00056 (0.00027)
0.00012 (0.00016)	3e-05 (0.0014)	6e-04 (0.00024)
0.00018 (0.00011)	0.00038 (NA)	0.00064 (0.00018)
0.00025 (0.00016)	5e-05 (0.00121)	0.00053 (0.00024)
0.00046 (0.00016)	-8e-05 (0.00076)	0.00053 (0.00025)
9e-05 (0.00015)	0 (0.00125)	0.00061 (0.00022)
7e-04 (0.00018)	-6e-05 (0.00109)	0.00061 (0.00029)
0.00021 (0.00015)	-7e-05 (0.00096)	0.00072 (0.00022)
0.00045 (0.00017)	-8e-05 (0.00131)	0.00071 (0.00027)
4e-04 (0.00014)	0.00021 (NA)	0.00078 (0.00023)
0.00015 (0.00016)	6e-05 (0.0014)	0.00051 (0.00024)
0.00037 (0.00016)	5e-04 (0.00113)	6e-04 (0.00025)
0.00037 (0.00013)	0.00071 (NA)	0.00057 (0.00022)
0.00035 (0.00016)	-4e-05 (0.00104)	0.00059 (0.00025)
0.00035 (0.00014)	-1e-05 (0.00038)	0.00057 (0.00022)
0.00013 (9e-05)	0.00047 (NA)	0.00033 (0.00015)
0.00069 (0.00018)	0.00045 (0.00107)	0.00058 (0.00029)
0.00041 (0.00015)	0.00029 (0.00063)	8e-04 (0.00024)
0.00034 (0.00017)	0.00101 (0.00149)	7e-04 (0.00027)
0.00026 (0.00013)	-1e-04 (4e-04)	0.00045 (0.00021)
0.00066 (0.00019)	0 (0.0014)	0.00078 (3e-04)
0.00054 (0.00016)	-5e-05 (0.00083)	0.00108 (0.00026)
0.00032 (0.00012)	0.00074 (NA)	0.00044 (0.00021)
0.00039 (0.00017)	0.00014 (0.00141)	0.00068 (0.00027)
0.00022 (0.00016)	-4e-05 (0.00139)	0.00056 (0.00025)
0.00045 (0.00018)	-3e-05 (0.00139)	0.00066 (0.00028)
6e-04 (0.00018)	5e-05 (0.00119)	0.00089 (0.00028)
0.00062 (0.00016)	0.00041 (0.00034)	0.00079 (0.00026)
0.00078 (0.00019)	-0.00014 (0.00129)	0.001 (3e-04)
0.00056 (0.00017)	-8e-05 (0.00093)	0.00058 (0.00027)

0.00084 (2e-04)	-0.00011 (0.00138)	0.00088 (0.00032)
0.00014 (0.00014)	0.00029 (0.00083)	0.00044 (0.00021)
5e-04 (0.00013)	-0.00024 (NA)	0.00042 (0.00021)
0.00025 (0.00017)	-0.00015 (0.00138)	-6e-04 (0.00025)
0.00017 (0.00012)	4e-05 (NA)	4e-04 (0.00019)
0.00043 (0.00016)	0.00039 (0.00096)	0.00053 (0.00025)
0.00054 (0.00018)	-1e-04 (0.00139)	0.00068 (0.00028)
0.00023 (0.00017)	7e-05 (0.0014)	0.00081 (0.00025)
0.00025 (0.00017)	1e-04 (0.0014)	7e-04 (0.00025)
0.00037 (0.00017)	-1e-05 (0.00139)	0.00057 (0.00027)
0.00037 (0.00017)	0.00058 (0.00128)	0.00087 (0.00026)
0.00019 (0.00014)	-8e-05 (8e-04)	0.00051 (0.00021)
0.00014 (0.00013)	-0.00018 (0.00044)	0.00042 (0.00019)
0.00033 (0.00015)	0.00024 (0.00074)	0.00054 (0.00023)
0.00069 (0.00017)	0.00194 (0.00117)	-0.00071 (3e-04)
0.00036 (0.00014)	6e-05 (NA)	0.00052 (0.00022)
0.00065 (0.00016)	0.00183 (0.00078)	0.00072 (0.00028)
0.00035 (0.00011)	0.00023 (NA)	0.00045 (0.00019)
0.00029 (0.00015)	-0.00016 (0.00084)	5e-04 (0.00023)
0.00053 (0.00014)	7e-05 (NA)	0.00099 (0.00023)
0.00024 (0.00014)	9e-05 (7e-04)	0.00048 (0.00022)
0.00037 (0.00017)	0.00057 (0.00145)	0.00059 (0.00027)
7e-04 (0.00019)	-1e-04 (0.00139)	7e-04 (3e-04)
0.00047 (0.00018)	-2e-04 (0.00138)	0.00075 (0.00028)
7e-04 (0.00015)	-3e-05 (NA)	0.00072 (0.00026)
0.00029 (0.00012)	0.00013 (NA)	0.00053 (2e-04)
0.00058 (0.00017)	-0.00021 (0.00097)	-0.00075 (0.00027)
0.00036 (0.00013)	0.00061 (NA)	0.00048 (0.00022)
0.00022 (0.00013)	0.00018 (0.00023)	0.00059 (2e-04)
0.00075 (0.00019)	-8e-05 (0.00137)	0.00083 (0.00031)
0.00054 (0.00017)	0.00138 (0.00125)	0.00061 (0.00028)
0.00019 (0.00012)	1e-05 (NA)	0.00055 (0.00018)
0.00035 (0.00017)	-3e-05 (0.00139)	0.00081 (0.00026)
0.00027 (0.00017)	-0.00021 (0.00137)	0.00061 (0.00025)
8e-05 (0.00011)	-0.00012 (NA)	0.00054 (0.00017)
0.00034 (0.00017)	-0.00011 (0.00138)	0.00083 (0.00026)
0.00045 (0.00016)	2e-05 (0.00097)	0.00077 (0.00025)
0.00045 (0.00015)	0.00039 (6e-04)	0.00059 (0.00024)
0.00043 (0.00017)	-6e-05 (0.00113)	0.00054 (0.00026)
0.00026 (0.00013)	2e-05 (0.00041)	0.00084 (0.00021)
0.00028 (0.00017)	-1e-05 (0.00139)	0.00053 (0.00025)
0.00062 (0.00018)	-1e-05 (0.00117)	0.00062 (0.00028)
0.00016 (0.00014)	-0.00016 (0.00087)	0.00047 (0.00021)
3e-04 (0.00017)	-8e-05 (0.00139)	0.00057 (0.00026)
0.00063 (0.00019)	7e-05 (0.00134)	0.00076 (0.00029)
0.00036 (0.00013)	-2e-05 (NA)	0.00072 (0.00021)
0.00086 (0.00018)	0.00093 (0.00085)	0.00152 (3e-04)

0.00141 (2e-04)	0.00036 (0.00061)	0.00071 (0.00035)
0.00051 (0.00018)	0.00031 (0.00078)	-0.00078 (2e-04)
0.00064 (0.00019)	0.00022 (0.00077)	0.00045 (0.00021)
0.00016 (0.00016)	0.00051 (8e-04)	0.00047 (0.00017)
0.00079 (2e-04)	0.00027 (0.00078)	0.00079 (0.00022)
0.00082 (2e-04)	0.00034 (0.00078)	-0.00065 (0.00022)
4e-04 (0.00017)	0.00031 (0.00078)	0.00113 (0.00019)
5e-04 (0.00018)	0.00028 (0.00078)	-0.00045 (2e-04)
0.00047 (0.00018)	0.00019 (0.00077)	-0.00063 (0.00019)
0.00038 (0.00017)	0.00041 (0.00079)	-0.00039 (0.00019)
0.00048 (0.00018)	0.00031 (0.00078)	0.00048 (0.00019)
0.00023 (0.00016)	0.00016 (0.00077)	0.00048 (0.00017)
0.00028 (0.00017)	1e-04 (0.00076)	-0.00034 (0.00017)
0.00025 (0.00017)	0.00032 (0.00078)	0.00039 (0.00018)
0.00079 (2e-04)	0.00026 (0.00078)	0.00053 (0.00022)
0.00086 (2e-04)	0.00026 (0.00078)	-0.00054 (0.00022)
4e-04 (0.00018)	0.00045 (0.00079)	-4e-04 (0.00019)
9e-04 (2e-04)	9e-05 (0.00076)	0.00083 (0.00022)
0.00025 (0.00017)	0.00142 (0.00087)	-0.00039 (0.00019)
0.00034 (0.00017)	0.00046 (0.00079)	4e-04 (0.00018)
0.00081 (2e-04)	0.00015 (0.00077)	0.00074 (0.00022)
0.00034 (0.00017)	0.00019 (0.00077)	0.00047 (0.00018)
0.00021 (0.00016)	0.00059 (0.00079)	0.00037 (0.00017)
0.00048 (0.00018)	4e-04 (0.00079)	0.00051 (2e-04)
0.00039 (0.00017)	0.00019 (0.00077)	0.00041 (0.00019)
4e-04 (0.00017)	0.00015 (0.00077)	0.00047 (0.00018)
0.00036 (0.00017)	8e-05 (0.00076)	0.00036 (0.00018)
4e-05 (0.00015)	0.00021 (0.00077)	4e-04 (0.00015)
3e-04 (0.00017)	0.00323 (0.00099)	-8e-04 (0.00022)
0.00133 (0.00022)	1e-04 (0.00076)	0.00058 (0.00025)
0.00042 (0.00018)	-0.00013 (0.00074)	0.00041 (0.00018)
0.00084 (2e-04)	1e-04 (0.00076)	0.00048 (0.00022)
0.00022 (0.00015)	0.00073 (0.00069)	0.00052 (0.00017)
0.00052 (0.00018)	0.00038 (0.00079)	0.00055 (2e-04)
0.00051 (0.00018)	-4e-05 (0.00075)	-0.00082 (0.00019)
0.00046 (0.00018)	0.00012 (0.00076)	-0.00045 (0.00019)
0.00061 (0.00019)	0.00033 (0.00078)	0.00042 (2e-04)
0.00033 (0.00017)	2e-05 (0.00075)	0.00043 (0.00018)
0.00022 (0.00016)	0.00048 (0.00079)	-0.00041 (0.00017)
0.00041 (0.00018)	0.00097 (0.00083)	7e-04 (2e-04)
0.00047 (0.00018)	0.00037 (0.00079)	-0.00075 (0.00019)
0.00021 (0.00013)	-5e-05 (4e-04)	0.00036 (0.00014)
0.00058 (0.00018)	8e-05 (0.00076)	0.00047 (2e-04)
0.00036 (0.00017)	0.00046 (0.00079)	-0.00045 (0.00019)
0.00052 (0.00018)	2e-04 (0.00077)	-0.00064 (2e-04)
0.00047 (0.00018)	0.00069 (0.00081)	-0.00083 (2e-04)
3e-04 (0.00017)	9e-05 (0.00076)	0.00037 (0.00018)

0.00052 (0.00016)	0.00059 (6e-04)	0.00059 (0.00019)
4e-04 (0.00013)	0.00014 (1e-04)	0.00031 (0.00015)
6e-04 (0.00019)	7e-05 (0.00076)	-0.00063 (2e-04)
0.00031 (0.00017)	0.00034 (0.00078)	0.00048 (0.00018)
0.00054 (0.00018)	0.00028 (0.00078)	0.00043 (2e-04)
0.00045 (0.00018)	0.00054 (8e-04)	0.00051 (0.00019)
0.00022 (0.00016)	-2e-05 (0.00075)	-0.00034 (0.00017)
0.00034 (0.00017)	8e-05 (0.00076)	-0.00038 (0.00018)
0.00045 (0.00018)	-7e-05 (0.00075)	0.00037 (0.00019)
0.00042 (0.00018)	0.00014 (0.00077)	-0.00047 (0.00019)
0.00036 (0.00017)	0.00024 (0.00077)	-0.00043 (0.00018)
0.00067 (0.00019)	0.00011 (0.00076)	0.00048 (0.00021)
0.00034 (0.00017)	0.00083 (0.00082)	-0.00041 (0.00019)
0.00041 (0.00018)	0.00028 (0.00078)	0.00054 (0.00019)
0.00032 (0.00017)	0.00022 (0.00077)	0.00042 (0.00018)
4e-04 (0.00017)	0.00042 (0.00079)	0.00043 (0.00019)
0.00023 (0.00016)	1e-04 (0.00076)	-4e-04 (0.00017)
1e-04 (0.00016)	0.00048 (0.00079)	0.00043 (0.00016)
0.00103 (0.00021)	-0.00013 (0.00074)	-0.00059 (0.00023)
4e-04 (0.00017)	1e-04 (0.00076)	0.00059 (0.00018)
0.00035 (0.00017)	0.00015 (0.00077)	0.00038 (0.00018)
0.00057 (0.00018)	0.00029 (0.00078)	0.00048 (2e-04)
0.00035 (0.00017)	0.00014 (0.00077)	0.00052 (0.00018)
0.00034 (0.00016)	0.00027 (0.00064)	-5e-04 (0.00017)
0.00023 (0.00016)	0.00033 (0.00078)	-0.00056 (0.00017)
0.00025 (0.00017)	0.00036 (0.00078)	-0.00046 (0.00018)
9e-04 (2e-04)	0.00037 (0.00078)	0.00045 (0.00023)
0.00016 (0.00016)	5e-04 (8e-04)	-0.00039 (0.00017)
0.00042 (0.00018)	1e-05 (0.00075)	0.00048 (0.00019)
0.00032 (0.00017)	-3e-05 (0.00074)	-0.00036 (0.00017)
0.00015 (0.00016)	0.00069 (0.00081)	0.00036 (0.00017)
0.00067 (0.00019)	0.00045 (0.00079)	0.00046 (0.00021)
0.00028 (0.00017)	-8e-05 (0.00074)	0.00045 (0.00017)
0.00014 (0.00014)	-5e-05 (0.00058)	0.00028 (0.00014)
0.00051 (0.00018)	0.00015 (0.00077)	0.00067 (0.00019)
0.00027 (0.00017)	3e-05 (0.00076)	0.00036 (0.00017)
0.00024 (0.00017)	0.00045 (0.00079)	-0.00035 (0.00018)
0.00019 (0.00016)	5e-05 (0.00076)	-5e-04 (0.00016)
0.00031 (0.00017)	-0.00013 (0.00074)	0.00044 (0.00017)
4e-04 (0.00017)	0.00088 (0.00083)	0.00056 (0.00019)
0.00045 (0.00018)	-0.00019 (0.00074)	-0.00037 (0.00019)
0.00037 (0.00017)	0.00015 (0.00077)	0.00039 (0.00018)
1e-04 (0.00016)	0.00021 (0.00077)	-0.00034 (0.00016)
0.00088 (2e-04)	9e-05 (0.00076)	0.00045 (0.00022)
0.00036 (0.00017)	0.00045 (0.00079)	0.00044 (0.00019)
0.00064 (0.00019)	0.00069 (0.00081)	-0.00082 (0.00021)
0.00029 (0.00017)	0.00047 (0.00079)	0.00068 (0.00018)

0.00037 (0.00017)	0.00033 (0.00078)	-0.00042 (0.00019)
0.00053 (0.00018)	6e-05 (0.00076)	-0.00057 (0.00019)
0.00048 (0.00018)	7e-05 (0.00076)	0.00074 (0.00019)
1e-04 (0.00016)	0 (0.00075)	-0.00035 (0.00016)
0.00049 (0.00018)	0.00082 (0.00082)	0.00058 (2e-04)
0.00065 (0.00019)	0.00043 (0.00079)	0.00043 (0.00021)
0.00055 (0.00018)	0.00097 (0.00083)	0.00081 (0.00021)
0.00084 (2e-04)	-3e-05 (0.00075)	5e-04 (0.00022)
0.00039 (0.00017)	0.00031 (0.00078)	0.00041 (0.00019)
0.00012 (0.00016)	0.00085 (0.00082)	0.00034 (0.00017)
0.00034 (0.00017)	0.00065 (0.00081)	0.00046 (0.00019)
0.00021 (0.00016)	0.00024 (0.00077)	-0.00035 (0.00017)
0.00033 (0.00017)	0.00022 (0.00077)	5e-04 (0.00018)
0.00038 (0.00017)	-2e-05 (0.00075)	4e-04 (0.00018)
0.00041 (0.00018)	-3e-05 (0.00075)	-0.00048 (0.00018)
3e-04 (0.00017)	0.00017 (0.00077)	0.00054 (0.00018)
0.00032 (0.00014)	-5e-05 (0.00041)	-0.00031 (0.00015)
7e-04 (0.00019)	0.00059 (8e-04)	0.00061 (0.00021)
7e-04 (0.00019)	3e-04 (0.00078)	0.00043 (0.00021)
0.00014 (0.00016)	0.00013 (0.00076)	0.00038 (0.00016)
0.00056 (0.00018)	0.00044 (0.00079)	0.00058 (2e-04)
4e-04 (0.00017)	3e-04 (0.00078)	-0.00037 (0.00019)
0.00014 (0.00016)	-2e-04 (0.00074)	-0.00032 (0.00016)
2e-04 (0.00016)	0.00037 (0.00078)	0.00036 (0.00017)
0.00025 (0.00017)	1e-04 (0.00076)	-0.00042 (0.00017)
0.00084 (2e-04)	-7e-05 (0.00075)	0.00051 (0.00022)
0.00056 (0.00018)	5e-04 (8e-04)	-0.00041 (2e-04)
9e-04 (2e-04)	-3e-05 (0.00075)	-5e-04 (0.00022)
0.00018 (0.00016)	0.00016 (0.00077)	-0.00052 (0.00017)
0.00054 (0.00018)	1e-05 (0.00075)	-0.00043 (2e-04)
0.00113 (0.00021)	3e-04 (0.00078)	-0.00061 (0.00024)
5e-04 (0.00018)	0.00035 (0.00078)	-0.00039 (2e-04)
0.00063 (0.00019)	0.00032 (0.00078)	0.00054 (0.00021)
0.00031 (0.00017)	0.00041 (0.00079)	0.00042 (0.00018)
0.00047 (0.00015)	0.00013 (0.00048)	-0.00047 (0.00017)
0.00019 (0.00016)	6e-04 (8e-04)	0.00051 (0.00017)
0.00112 (0.00021)	-1e-05 (0.00075)	-0.00059 (0.00024)
0.00014 (0.00016)	-6e-05 (0.00075)	-0.00041 (0.00016)
7e-05 (0.00015)	0.00057 (0.00077)	0.00035 (0.00016)
3e-04 (0.00017)	0.00032 (0.00078)	0.00035 (0.00018)
0.00037 (0.00017)	0.00013 (0.00076)	-0.00036 (0.00018)
0.00033 (0.00017)	0.00011 (0.00076)	-0.00041 (0.00018)
0.00043 (0.00018)	2e-04 (0.00077)	-4e-04 (0.00019)
0.00055 (0.00018)	9e-05 (0.00076)	-0.00054 (2e-04)
0.00017 (0.00016)	-0.00019 (0.00074)	0.00049 (0.00016)
3e-04 (0.00017)	0.00037 (0.00078)	0.00039 (0.00018)
0.00049 (0.00018)	3e-04 (0.00078)	0.00042 (0.00019)

5e-04 (0.00016)	0.00014 (0.00051)	5e-04 (0.00018)
0.00071 (0.00019)	-5e-05 (0.00075)	0.00047 (0.00021)
0.00047 (0.00018)	0.00018 (0.00077)	-0.00042 (0.00019)
4e-04 (0.00017)	0.00063 (0.00081)	0.00057 (0.00019)
2e-04 (0.00016)	0.00032 (0.00078)	-4e-04 (0.00017)
0.00046 (0.00018)	-6e-05 (0.00075)	-0.00065 (0.00019)
0.00047 (0.00018)	-5e-05 (0.00075)	-4e-04 (0.00019)
0.00015 (0.00016)	5e-05 (0.00076)	-0.00043 (0.00016)
3e-04 (0.00017)	4e-05 (0.00076)	-5e-04 (0.00017)
0.00039 (0.00017)	1e-04 (0.00076)	-0.00046 (0.00018)
0.00039 (0.00017)	-8e-05 (0.00075)	-0.00036 (0.00018)
0.00055 (0.00018)	0.00014 (0.00077)	-0.00043 (2e-04)
0.00025 (0.00017)	0.00026 (0.00078)	0.00059 (0.00017)
0.00038 (0.00017)	-3e-05 (0.00075)	0.00039 (0.00018)
0.00043 (0.00018)	5e-05 (0.00076)	0.00037 (0.00019)
0.00041 (0.00018)	4e-05 (0.00076)	-0.00061 (0.00018)
0.00059 (0.00019)	0.00054 (8e-04)	-0.00047 (0.00021)
0.00022 (0.00016)	-2e-05 (0.00075)	-0.00038 (0.00017)
0.00039 (0.00017)	4e-05 (0.00076)	0.00054 (0.00018)
0.00057 (0.00016)	0.00045 (5e-04)	-0.00039 (0.00018)
0.00051 (0.00018)	-5e-05 (0.00074)	0.00043 (0.00019)
0.00046 (0.00018)	0.00067 (0.00081)	0.00082 (2e-04)
0.00035 (0.00017)	0.00023 (0.00077)	0.00051 (0.00018)
0.00039 (0.00017)	-1e-05 (0.00075)	0.00045 (0.00018)
0.00012 (0.00016)	2e-04 (0.00077)	0.00037 (0.00016)
2e-04 (0.00016)	-1e-05 (0.00075)	-0.00038 (0.00017)
0.00031 (0.00017)	0.00029 (0.00078)	-0.00051 (0.00018)
0.00084 (2e-04)	0.00037 (0.00078)	0.00056 (0.00022)
0.00039 (0.00017)	-9e-05 (0.00075)	0.00041 (0.00018)
0.00017 (0.00016)	0.00059 (8e-04)	-0.00037 (0.00017)
0.00046 (0.00018)	-1e-05 (0.00075)	0.00054 (0.00019)
0.00047 (0.00018)	-7e-05 (0.00075)	-0.00038 (0.00019)
6e-04 (0.00019)	1e-04 (0.00076)	0.00048 (2e-04)
0.00041 (0.00018)	1e-05 (0.00075)	0.00057 (0.00018)
0.00017 (0.00016)	8e-05 (0.00076)	0.00064 (0.00016)
0.00059 (0.00019)	0.00065 (0.00081)	6e-04 (0.00021)
0.00037 (0.00017)	-6e-05 (0.00075)	-4e-04 (0.00018)
0.00031 (0.00017)	-0.00014 (0.00074)	0.00037 (0.00017)
0.00023 (0.00016)	1e-05 (0.00075)	-0.00033 (0.00017)
0.00038 (0.00017)	0.00018 (0.00077)	0.00059 (0.00018)
0.00079 (2e-04)	0.00032 (0.00078)	0.00049 (0.00022)
0.00014 (0.00016)	1e-04 (0.00076)	-0.00048 (0.00016)
0.00019 (0.00016)	-4e-05 (0.00075)	4e-04 (0.00016)
0.00052 (0.00018)	9e-05 (0.00076)	4e-04 (0.00019)
0.00029 (0.00017)	0.00022 (0.00077)	-0.00065 (0.00018)
3e-04 (0.00017)	0.00034 (0.00078)	0.00036 (0.00018)
0.00047 (0.00018)	-2e-05 (0.00075)	0.00068 (0.00019)

4e-04 (0.00018)	-2e-05 (0.00075)	0.00046 (0.00018)
0.00033 (0.00017)	0.00037 (0.00078)	0.00048 (0.00018)
0.00027 (0.00017)	0.00018 (0.00077)	4e-04 (0.00017)
0.00026 (0.00017)	0.00032 (0.00078)	0.00041 (0.00018)
0.00052 (0.00018)	0.00048 (0.00079)	0.00058 (2e-04)
0.00025 (0.00017)	0.00027 (0.00078)	0.00049 (0.00017)
0.00036 (0.00017)	0.00023 (0.00077)	0.00055 (0.00018)
7e-04 (0.00019)	0.00057 (8e-04)	0.00099 (0.00021)
0.00028 (0.00017)	0.00018 (0.00077)	-0.00054 (0.00018)
0.00086 (2e-04)	0.00125 (0.00085)	0.00055 (0.00023)
0.00036 (0.00017)	2e-04 (0.00077)	-0.00046 (0.00018)
0.00014 (0.00016)	0.00043 (0.00079)	-0.00035 (0.00017)
0.00031 (0.00017)	-9e-05 (0.00075)	0.00043 (0.00017)
0.00065 (0.00019)	-4e-05 (0.00074)	-0.00066 (2e-04)
0.00081 (2e-04)	3e-05 (0.00074)	0.00047 (0.00021)
0.00021 (0.00017)	0.00044 (0.00078)	0.00038 (0.00017)
0.00033 (0.00017)	0.00038 (0.00077)	0.00047 (0.00018)
0.00065 (0.00018)	8e-05 (0.00066)	0.00057 (2e-04)
0.00016 (0.00016)	0 (0.00074)	0.00034 (0.00016)
0.00018 (0.00014)	1e-04 (0.00055)	-0.00029 (0.00015)
0.00109 (0.00021)	0.00031 (0.00077)	6e-04 (0.00023)
0.00032 (0.00017)	-9e-05 (0.00073)	0.00037 (0.00018)
0.00075 (2e-04)	-0.00013 (0.00073)	0.00042 (0.00021)
0.00019 (0.00016)	0.00026 (0.00076)	0.00053 (0.00017)
0.00063 (0.00019)	0.00016 (0.00075)	4e-04 (2e-04)
0.00038 (0.00018)	0.00019 (0.00076)	5e-04 (0.00018)
0.00033 (0.00014)	-3e-05 (0.00048)	0.00042 (0.00015)
0.00037 (0.00018)	0.00013 (0.00075)	0.00068 (0.00018)
0.00022 (0.00017)	9e-05 (0.00075)	0.00039 (0.00017)
0.00059 (0.00019)	0.00128 (0.00084)	0.00066 (0.00021)
0.00024 (0.00017)	0.00023 (0.00076)	0.00037 (0.00017)
0.00068 (0.00019)	3e-05 (0.00074)	0.00049 (2e-04)
0.00038 (0.00018)	7e-05 (0.00075)	0.00046 (0.00018)
0.00041 (0.00018)	2e-04 (0.00076)	0.00038 (0.00019)
0.00039 (0.00018)	-0.00011 (0.00073)	0.00045 (0.00018)
0.00037 (0.00018)	5e-05 (0.00075)	0.00047 (0.00018)
7e-04 (0.00019)	0.00036 (0.00077)	0.00042 (0.00021)
0.00102 (2e-04)	0.00023 (7e-04)	0.00068 (0.00023)
0.00034 (0.00017)	-6e-05 (0.00074)	4e-04 (0.00018)
0.00039 (0.00018)	-1e-05 (0.00074)	0.00037 (0.00018)
0.00039 (0.00018)	-0.00018 (0.00073)	0.00061 (0.00018)
0.00089 (2e-04)	0.00086 (0.00081)	0.00066 (0.00023)
0.00133 (0.00022)	0.00185 (0.00088)	0.00074 (0.00026)
0.00047 (0.00018)	0.00011 (0.00075)	0.00037 (0.00019)
2e-04 (0.00017)	8e-05 (0.00075)	0.00044 (0.00017)
0.00016 (0.00016)	0.00058 (0.00079)	0.00061 (0.00017)
0.00041 (0.00018)	-3e-05 (0.00074)	0.00058 (0.00018)

0.00091 (2e-04)	0.00055 (0.00078)	0.00054 (0.00023)
0.00061 (0.00019)	7e-05 (0.00075)	0.00054 (2e-04)
0.00051 (0.00018)	0.00015 (0.00075)	0.00041 (0.00019)
5e-04 (0.00018)	0.00013 (0.00075)	-0.00052 (0.00019)
3e-04 (0.00017)	0.00011 (0.00075)	0.00039 (0.00018)
0.00056 (0.00019)	3e-05 (0.00074)	0.00063 (2e-04)
0.00062 (0.00019)	-1e-05 (0.00074)	0.00051 (2e-04)
0.00017 (0.00016)	0.00016 (0.00075)	0.00036 (0.00017)
0.00045 (0.00018)	4e-05 (0.00074)	0.00038 (0.00019)
0.00019 (0.00017)	0.00068 (0.00079)	-0.00037 (0.00018)
0.00041 (0.00018)	-0.00017 (0.00073)	0.00037 (0.00018)
4e-04 (0.00018)	6e-05 (0.00075)	0.00038 (0.00018)
0.00046 (0.00018)	-5e-05 (0.00074)	0.00045 (0.00019)
0.00108 (0.00021)	0.00035 (0.00077)	0.00046 (0.00023)
0.00026 (0.00017)	-0.00013 (0.00073)	0.00037 (0.00017)
0.00022 (0.00017)	0.00014 (0.00075)	0.00049 (0.00017)
0.00021 (0.00014)	8e-05 (5e-04)	0.00036 (0.00014)
0.00033 (0.00017)	0.00014 (0.00075)	0.00048 (0.00018)
0.00024 (0.00017)	0.00018 (0.00076)	0.00035 (0.00017)
0.00029 (0.00017)	0.00016 (0.00075)	0.00075 (0.00018)
0.00087 (2e-04)	0.00026 (0.00076)	0.00062 (0.00022)
0.00023 (0.00015)	0.00039 (0.00061)	0.00047 (0.00016)
2e-04 (0.00017)	8e-05 (0.00075)	0.00039 (0.00017)
0.00034 (0.00017)	-0.00015 (0.00073)	-0.00046 (0.00018)
0.00041 (0.00018)	-0.00012 (0.00073)	4e-04 (0.00018)
0.00036 (0.00018)	0.00018 (0.00076)	0.00039 (0.00018)
0.00028 (0.00017)	0.00012 (0.00075)	0.00039 (0.00017)
0.00025 (0.00017)	0.00031 (0.00077)	0.00038 (0.00018)
0.00037 (0.00018)	0.00055 (0.00078)	4e-04 (0.00019)
0.00031 (0.00017)	0.00053 (0.00078)	0.00037 (0.00018)
0.00023 (0.00017)	0.00051 (0.00078)	0.00035 (0.00018)
0.00027 (0.00017)	1e-05 (0.00074)	4e-04 (0.00017)
0.00054 (0.00018)	-4e-05 (0.00074)	7e-04 (0.00019)
0.00057 (0.00019)	0.00015 (0.00075)	0.00064 (2e-04)
0.00056 (0.00019)	0.00028 (0.00076)	0.00047 (2e-04)
0.00043 (0.00018)	2e-05 (0.00074)	0.00038 (0.00019)
5e-04 (0.00018)	-0.00013 (0.00073)	0.00043 (0.00019)
0.00044 (0.00018)	8e-04 (8e-04)	-0.00044 (2e-04)
6e-05 (0.00016)	-1e-04 (0.00073)	0.00033 (0.00015)
0.00043 (0.00018)	-0.00017 (0.00073)	0.00054 (0.00018)
0.00027 (0.00017)	-3e-05 (0.00074)	0.00041 (0.00017)
0.00025 (0.00017)	0.00014 (0.00075)	0.00038 (0.00017)
0.00035 (0.00017)	-9e-05 (0.00073)	0.00057 (0.00018)
0.00044 (0.00018)	-1e-04 (0.00073)	4e-04 (0.00018)
0.00048 (0.00018)	4e-05 (0.00074)	0.00053 (0.00019)
0.00041 (0.00018)	-4e-05 (0.00074)	4e-04 (0.00018)
0.00028 (0.00017)	-0.00015 (0.00073)	0.00034 (0.00017)

0.00021 (0.00017)	0.00048 (0.00078)	0.00035 (0.00017)
0.00029 (0.00014)	0.00022 (0.00049)	3e-04 (0.00015)
9e-04 (2e-04)	1e-05 (0.00074)	0.00046 (0.00022)
5e-04 (0.00018)	0.00025 (0.00076)	0.00046 (0.00019)
0.00029 (0.00017)	0.00027 (0.00076)	0.00048 (0.00018)
0.00021 (0.00017)	-6e-05 (0.00074)	0.00051 (0.00017)
0.00033 (0.00017)	0.00047 (0.00076)	4e-04 (0.00018)
0.00018 (0.00016)	0.00023 (0.00076)	0.00036 (0.00017)
0.00036 (0.00017)	-1e-05 (0.00074)	0.00046 (0.00018)
0.00026 (0.00017)	9e-05 (0.00075)	0.00036 (0.00017)
0.00037 (0.00018)	-0.00013 (0.00073)	0.00039 (0.00018)
0.00016 (0.00016)	-4e-05 (0.00074)	0.00049 (0.00016)
0.00026 (0.00017)	-2e-05 (0.00074)	0.00055 (0.00017)
0.00028 (0.00017)	-3e-05 (0.00074)	-0.00036 (0.00017)
0.00035 (0.00017)	1e-05 (0.00074)	0.00062 (0.00018)
8e-05 (0.00016)	0.00012 (0.00075)	0.00031 (0.00016)
0.00029 (0.00017)	5e-05 (0.00075)	4e-04 (0.00017)
0.00054 (0.00019)	9e-05 (0.00075)	5e-04 (2e-04)
0.00057 (0.00019)	0.00035 (0.00077)	0.00044 (2e-04)
0.00053 (0.00018)	-6e-05 (0.00074)	0.00051 (0.00019)
0.00031 (0.00017)	-9e-05 (0.00073)	0.00047 (0.00017)
0.00065 (0.00019)	5e-05 (0.00075)	-0.00046 (2e-04)
0.00035 (0.00017)	9e-05 (0.00075)	0.00038 (0.00018)
0.00057 (0.00019)	3e-05 (0.00074)	0.00045 (2e-04)
0.00045 (0.00018)	0.00075 (8e-04)	0.00054 (2e-04)
0.00045 (0.00018)	-9e-05 (0.00073)	0.00054 (0.00019)
0.00023 (0.00015)	0.00033 (6e-04)	0.00034 (0.00016)
0.00042 (0.00018)	-0.00013 (0.00073)	0.00044 (0.00018)
0.00031 (0.00017)	2e-05 (0.00074)	4e-04 (0.00018)
0.00016 (0.00012)	9e-05 (0.00041)	0.00032 (0.00013)
0.00094 (2e-04)	0.00011 (0.00066)	0.00045 (0.00022)
7e-04 (0.00017)	0.00013 (0.00053)	5e-04 (0.00019)
0.00039 (0.00018)	0.00011 (0.00075)	0.00038 (0.00018)
0.00037 (0.00017)	0.00038 (0.00076)	0.00038 (0.00018)
0.00032 (0.00014)	6e-05 (0.00049)	3e-04 (0.00015)
0.00019 (0.00016)	-0.00014 (0.00073)	0.00034 (0.00016)
0.00019 (0.00016)	7e-04 (0.00079)	0.00045 (0.00018)
0.00071 (0.00019)	0.00018 (0.00076)	0.00041 (0.00021)
0.00057 (0.00019)	0.00034 (0.00077)	0.00049 (2e-04)
0.00039 (0.00018)	9e-05 (0.00075)	0.00041 (0.00018)
0.00011 (0.00016)	-5e-05 (0.00074)	0.00035 (0.00016)
0.00016 (0.00016)	-0.00013 (0.00073)	0.00035 (0.00016)
1e-04 (0.00016)	-1e-04 (0.00073)	0.00031 (0.00016)
0.00025 (0.00017)	7e-05 (0.00075)	0.00051 (0.00017)
0.00036 (0.00018)	8e-05 (0.00075)	0.00038 (0.00018)
0.00017 (0.00016)	0.00027 (0.00076)	5e-04 (0.00017)
0.00032 (0.00017)	0.00012 (0.00075)	0.00047 (0.00018)

0.00057 (0.00019)	0.00076 (8e-04)	0.00073 (0.00021)
0.00025 (0.00017)	-6e-05 (0.00074)	0.00037 (0.00017)
0.00032 (0.00013)	9e-05 (0.00039)	0.00033 (0.00015)
0.00019 (0.00016)	-0.00016 (0.00073)	0.00036 (0.00016)
0.00065 (0.00019)	0.00035 (0.00077)	0.00042 (0.00021)
0.00067 (0.00019)	6e-04 (0.00079)	0.00059 (0.00021)
0.00054 (0.00019)	2e-04 (0.00076)	0.00054 (2e-04)
0.00016 (0.00016)	-7e-05 (0.00074)	0.00033 (0.00016)
2e-04 (0.00017)	0.00026 (0.00076)	0.00041 (0.00017)
0.00063 (0.00019)	0.00024 (0.00076)	0.00082 (2e-04)
0.00033 (0.00017)	0.00026 (0.00076)	0.00074 (0.00018)
0.00074 (2e-04)	-4e-05 (0.00074)	0.00042 (0.00021)
0.00079 (2e-04)	-5e-05 (0.00074)	0.00062 (0.00021)
0.00033 (0.00017)	0.00017 (0.00076)	0.00043 (0.00018)
0.00057 (0.00019)	8e-05 (0.00075)	0.00051 (2e-04)
0.00015 (0.00016)	3e-05 (0.00074)	0.00035 (0.00016)
0.00081 (2e-04)	1e-05 (0.00074)	0.00066 (0.00021)
0.0013 (0.00022)	1e-05 (0.00074)	0.00068 (0.00024)
0.00031 (0.00017)	9e-05 (0.00075)	0.00043 (0.00018)
0.00032 (0.00017)	0.00011 (0.00075)	0.00037 (0.00018)
0.00037 (0.00018)	2e-05 (0.00074)	0.00045 (0.00018)
4e-04 (0.00018)	0.00029 (0.00076)	0.00047 (0.00019)
0.00014 (0.00016)	5e-05 (0.00075)	0.00037 (0.00016)
0.00032 (0.00017)	9e-05 (0.00075)	0.00035 (0.00018)
0.00033 (0.00017)	0.0011 (0.00083)	0.00063 (0.00019)
3e-04 (0.00017)	9e-05 (0.00075)	0.00038 (0.00018)
0.00049 (0.00017)	4e-05 (0.00062)	0.00043 (0.00018)
0.00045 (0.00018)	-8e-05 (0.00073)	7e-04 (0.00019)
0.00051 (0.00018)	7e-05 (0.00075)	0.00056 (0.00019)
0.00046 (0.00018)	0.00061 (0.00079)	0.00043 (2e-04)
0.00048 (0.00018)	-1e-05 (0.00074)	0.00039 (0.00019)
0.00064 (0.00019)	0.00014 (0.00075)	0.00044 (2e-04)
7e-04 (0.00019)	0.00029 (0.00076)	0.00042 (0.00021)
0.00034 (0.00017)	-4e-05 (0.00074)	0.00038 (0.00018)
0.00046 (0.00018)	-4e-05 (0.00074)	0.00037 (0.00019)
3e-04 (0.00017)	-0.00015 (0.00073)	-0.00035 (0.00017)
8e-05 (0.00016)	5e-04 (0.00078)	-0.00041 (0.00016)
0.00056 (0.00019)	-0.00013 (0.00073)	0.00043 (0.00019)
0.00012 (0.00016)	0.00018 (0.00076)	0.00037 (0.00016)
8e-05 (0.00012)	0.00013 (0.00041)	0.00024 (0.00012)
0.00044 (0.00018)	0.00015 (0.00075)	-0.00038 (0.00019)
0.00054 (0.00019)	4e-05 (0.00074)	4e-04 (0.00019)
0.00047 (0.00018)	-5e-05 (0.00074)	0.00038 (0.00019)
5e-04 (0.00018)	0.00037 (0.00077)	0.00048 (2e-04)
0.00027 (0.00017)	0.00013 (0.00075)	0.00037 (0.00018)
0.00021 (0.00017)	-0.00014 (0.00073)	0.00036 (0.00017)
6e-04 (0.00016)	0.00036 (0.00055)	4e-04 (0.00018)

0.00055 (0.00019)	2e-05 (0.00074)	0.00074 (0.00019)
0.00086 (2e-04)	0.00012 (0.00075)	0.00049 (0.00022)
7e-04 (0.00019)	0.00035 (0.00077)	0.00046 (0.00021)
2e-04 (0.00017)	-3e-05 (0.00074)	0.00039 (0.00017)
0.00036 (0.00018)	1e-05 (0.00074)	0.00047 (0.00018)
0.00027 (0.00017)	0.00074 (8e-04)	4e-04 (0.00018)
0.00031 (0.00017)	-1e-05 (0.00073)	4e-04 (0.00017)
0.00023 (0.00017)	0 (0.00074)	4e-04 (0.00017)
0.00042 (0.00018)	0.00015 (0.00075)	0.00051 (0.00019)
0.00019 (0.00016)	0 (0.00074)	0.00046 (0.00017)
0.00053 (0.00018)	0.00043 (0.00078)	-0.00042 (2e-04)
0.00066 (0.00019)	0.00142 (0.00085)	-0.00063 (0.00022)
0.00043 (0.00018)	0.00013 (0.00075)	0.00057 (0.00019)
0.00053 (0.00018)	0.00013 (0.00075)	0.00062 (0.00019)
0.00029 (0.00017)	0.00063 (0.00079)	0.00037 (0.00018)
0.00027 (0.00017)	0.00025 (0.00076)	0.00044 (0.00018)
0.00079 (2e-04)	-3e-05 (0.00074)	0.00052 (0.00021)
0.00013 (0.00016)	-6e-05 (0.00074)	-0.00061 (0.00016)
0.00023 (0.00017)	0.00014 (0.00075)	5e-04 (0.00017)
0.00013 (0.00016)	5e-05 (0.00074)	0.00033 (0.00016)
0.00027 (0.00017)	-5e-05 (0.00074)	0.00035 (0.00017)
0.00029 (0.00017)	0.00038 (0.00077)	0.00044 (0.00018)
0.00029 (0.00017)	0.00048 (0.00078)	0.00045 (0.00018)
0.00033 (0.00017)	0.00035 (0.00077)	4e-04 (0.00018)
4e-04 (0.00018)	0 (0.00074)	0.00078 (0.00018)
0.00021 (0.00017)	5e-05 (0.00075)	0.00037 (0.00017)
0.00032 (0.00017)	-0.00012 (0.00073)	0.00037 (0.00018)
0.00028 (0.00017)	-1e-05 (0.00074)	0.00039 (0.00017)
0.00063 (0.00019)	0.00042 (0.00077)	0.00061 (0.00021)
0.00087 (2e-04)	0.00047 (0.00078)	-0.00047 (0.00022)

p-Value	BH-Corrected p-v	Genes Contained in this Locus
0.04812	0.999893375	CLSTN2, CLSTN2-AS1, PXYLP1, RPL23AP41, SLC25A36, SPSB4
0.031827	0.999893375	HSPA4L, INTU, SLC25A31
0.03824	0.999893375	AASS, ASB15, CADPS2, FEZF1, FEZF1-AS1, HYAL4, HYALP1, IC
0.010941	0.999893375	GTF2IP11, OR4A18P, OR4A19P, OR4A1P, OR4A2P, OR4A3P,
0.038635	0.999893375	OR4A5, OR4A6P
0.019169	0.999893375	GRAMD1B, OR10D1P, OR10D3, OR10D4P, OR10D5P, OR10G
0.033016	0.999893375	LINC02335, MIR5007
0.033586	0.99986	ACTBP13, AMIGO3, AMT, APEH, BSN, BSN-AS1, BSN-AS2, C3
0.0079213	0.99986	ATOH1, CCSER1, GRID2, HMGB3P15, KRT19P6, LNCPRESS2,
0.020986	0.99986	AMZ1, BRAT1, CHST12, EIF3B, GNA12, GRIFIN, IMMP1LP3, I
0.036411	0.99992	ABCA12, ATIC, BARD1, ENSAP3, FN1, RPL10P6, RPL5P8, SNO
0.010652	0.99992	KLHL32, MMS22L
0.036141	0.99992	ADHFE1, ARMC1, C8orf46, CRH, DNAJC5B, LINC00967, LINC
0.0097382	0.99992	CA10, LINC00483, LINC02071, LINC02072, LINC02073, LUC7
0.044348	0.99992	ABHD12, ACSS1, APMAP, CST7, ENTPD6, PYGB, RNU6-1257P
0.037034	0.99993	ARIH2, ARIH2OS, ATRIP, C3orf62, C3orf84, CAMP, CCDC36, C
0.044411	0.99993	ACOT13, ALDH5A1, C6orf229, C6orf62, DCDC2, GMNN, GPLI
0.02578	0.99993	ARFGEF3, CCDC28A, ECT2L, GVQW2, HEBP2, LINC02528, LIN
0.026685	0.99993	AMZ1, BRAT1, CHST12, EIF3B, GNA12, GRIFIN, IMMP1LP3, I
0.043591	0.99993	ADA, EIF4EBP2P1, FITM2, GDAP1L1, GTSF1L, HNF4A, HNF4A
0.039181	0.998476984	ASCL5, CACNA1S, CAMSAP2, CSRP1, DDX59, FAM58BP, GPR
0.040851	0.998476984	ACTR2, CEP68, KRT18P33, LINC01800, LINC02245, LINC0257
0.029039	0.998476984	ACTRT3, CLDN11, EGFEM1P, EIF5A2, GPR160, KLF7P1, KRT1
0.039393	0.998476984	ALG1L7P, ENPP7P9, FAM86EP, LYAR, NSG1, OR4D12P, OR7E
0.049373	0.998476984	ART3, BTC, CCDC158, CCNI, CDKL2, CXCL10, CXCL11, CXCL9,
0.0024856	0.998476984	ANKH, CCT6P2, DNAH5, EEF1A1P13, FAM105A, NENFP3, OT
0.042349	0.998476984	BMP5, COL21A1, HMGCLL1, NPM1P36
0.042358	0.998476984	GAPDHP15, GAPDHP41, GUSBP4, KHDRBS2, LINC00680, MT
0.018671	0.998476984	ADH5P4, NUFIP1P, RNU7-66P, SLC25A51P1
0.0080746	0.998476984	ARFGEF3, CCDC28A, ECT2L, GVQW2, HEBP2, LINC02528, LIN
0.023948	0.998476984	AIMP2, ANKRD61, CCZ1, CYTH3, DAGLB, EIF2AK1, FAM220A
0.033614	0.998476984	AGBL3, AKR1B1, AKR1B10, AKR1B15, BPGM, C7orf49, CALD1
0.049602	0.998476984	JHDM1D-AS1, KDM7A, PARP12, RNU6-797P, TBXAS1
0.046893	0.998476984	ADCK2, BRAF, CCT4P1, DENND2A, MKRN1, MRPS33, NDUFB
0.027681	0.998476984	AGPAT5, ANGPT2, DEFA1, DEFA10P, DEFA11P, DEFA1B, DEF
0.037726	0.998476984	HNF4G, LINC01109, LINC01111, RNU2-54P
0.047647	0.998476984	ARHGEF39, ATP8B5P, C9orf131, CA9, CCDC107, CCIN, CCL19
0.011982	0.998476984	NRG3, NRG3-AS1, RNU6-441P, RPA2P2, WARS2P1
0.045235	0.998476984	CALHM1, CALHM2, CALHM3, CFAP43, CFAP58, CFAP58-AS1,
0.01627	0.998476984	C10orf143, CTAGE7P, EBF3, GLRX3, MGMT, MIR4297, PPIAP
0.014114	0.998476984	ABCC8, AKR1B1P3, C11orf58, KCNJ11, MIR6073, NCR3LG1, N
0.022409	0.998476984	AMOTL1, ANKRD49, BUD13P1, C11orf97, CWC15, ENDOD1,

0.018227	0.998476984	APOLD1, BCL2L14, BORCS5, CDKN1B, CREBL2, DUSP16, ETV6
0.042545	0.998476984	ABI1P1, ATG14, CHMP4BP1, FBXO34, KTN1, KTN1-AS1, LINC
0.032159	0.998476984	ACTR10, ARID4A, C14orf37, CCDC198, DAAM1, DACT1, GPR1
0.02232	0.998476984	ADSSL1, AHNAK2, AKT1, APOPT1, ASPG, BAG5, C14orf180, C
0.0022577	0.998476984	ANXA2, CYCSP38, FOXB1, ICE2, MESTP2, NMNAT1P5, RNA5S
0.015229	0.998476984	CDH11, LINC00922, LINC02126, LINC02165, PPIAP48
0.045219	0.998476984	AANAT, CYCSP40, CYGB, JMJD6, LINC00868, LINC02080, ME
0.011384	0.998476984	CELF4, FHOD3, KIAA1328, MIR4318, RPL12P40, TPGS2
0.031534	0.999553009	AAK1, ADD2, ANTXR1, ANXA4, ASPRV1, B3GALNT1P1, BRD7
0.048462	0.999553009	ARIH2, ARIH2OS, ATRIP, C3orf62, C3orf84, CAMP, CCDC36, C
0.032595	0.999553009	ACTBP13, AMIGO3, AMT, APEH, BSN, BSN-AS1, BSN-AS2, C3
0.027956	0.999553009	CCDC50, CCT6P4, CLDN1, CLDN16, FGF12, FGF12-AS1, GCNT
0.015886	0.999553009	AMD1, BRD7P4, CDK19, CNN2P9, DDO, FAM229B, FCF1P5, F
0.017201	0.999553009	ASF1A, CEP85L, FAM184A, MCM9, NUS1, PLN, SELENOKP3, S
0.043502	0.999553009	CASC11, CASC19, CASC21, CASC8, CCAT2, FAM84B, LINC008
0.043919	0.999553009	ANXA2P3, CYP2C61P, DBF4P1, JMJD1C, JMJD1C-AS1, LINC01
0.031382	0.999553009	ANO3, FIBIN, MUC15, SLC5A12
0.046224	0.999553009	LINC02335, MIR5007
0.0071212	0.999553009	AATF, ACACA, ARHGAP23, C17orf78, C17orf98, CISD3, CWC2
0.026767	0.999553009	C21orf58, DIP2A, DIP2A-IT1, DSTNP1, LSS, MCM3AP, MCM3
0.045096	0.998728131	ACBD3, ACBD3-AS1, CDKN2AIPNLP1, DNAH14, ENAH, EPHX1
0.048589	0.998728131	ANKRD30B, BNIP3P3, CXADRP3, FGF7P1, GRAMD4P7, GTF2I
0.046138	0.998728131	CELF4, FHOD3, KIAA1328, MIR4318, RPL12P40, TPGS2
0.018132	0.999171053	ASCL5, CACNA1S, CAMSAP2, CSRP1, DDX59, FAM58BP, GPR
0.0092378	0.999171053	BLACAT1, C1orf186, CDK18, CNTN2, CTSE, DSTYK, ELK4, KLH
0.0038799	0.999171053	ASTN2, RN7SKP125, RN7SKP128, RNU6-1082P, RPL10P3, RP
0.047776	0.999171053	LINC00374, LINC02338, PCDH17, RNA5SP30
0.0025346	0.999171053	AATF, ACACA, ARHGAP23, C17orf78, C17orf98, CISD3, CWC2
0.032837	0.998859982	ABCA4, ABCD3, ARHGAP29, BCAR3, CHCHD2P5, DNTTIP2, FN
0.044686	0.998859982	DNAJC19P5, EVX2, EXTL2P1, FUCA1P1, HAGLR, HAGLROS, H
0.047898	0.998859982	ACTBP13, AMIGO3, AMT, APEH, BSN, BSN-AS1, BSN-AS2, C3
0.029125	0.998859982	ACTR6P1, AIMP1, ARHGEF38, ARHGEF38-IT1, ATP5EP1, DKK
0.039104	0.998859982	CASC15, HDGFL1, NBAT1, PRL, RN7SKP240
0.03237	0.998859982	AK3P3, EEF1A1P6, FAM126A, GPNMB, IGF2BP3, IL6, KLHL7,
0.047052	0.998859982	EIF4EP5, MIR383, PPM1AP1, RNU6-397P, RNU7-153P, SGCZ
0.025721	0.998859982	ARHGEF39, ATP8B5P, C9orf131, CA9, CCDC107, CCIN, CCL19
0.037703	0.998859982	AIFM1P1, ARL5B, CACNB2, HMGN1P20, MALRD1, NSUN6, R
0.013423	0.998859982	ABTB2, APIP, CAPRIN1, CAT, CD44, CD44-AS1, CIR1P3, EHF, I
0.030162	0.998859982	AHNAK, ASRGL1, ATL3, B3GAT3, BSCL2, C11orf95, C11orf98,
0.041875	0.998859982	COX5AP2, DDHD1, ERO1A, FERMT2, FRMD6, FRMD6-AS1, FI
0.01523	0.998859982	AKR1B1P7, CEBPA, CEBPA-AS1, CEBPG, CEP89, CHCHD2P3, C
0.021725	0.998859982	ANKEF1, C20orf187, FAT1P1, HIGD1AP15, JAG1, LINC01752,
0.0038739	0.99996	DPP4, EIF3EP2, FAP, GCA, GCG, IFIH1, KCNH7, RNA5SP109, F
0.043035	0.99996	ACVR2B, ACVR2B-AS1, CCR8, CSRNP1, CX3CR1, DDTP1, DSTN
0.043694	0.99996	ABHD14A, ABHD14A-ACY1, ABHD14B, ACTR8, ACY1, ALAS1,
0.0055521	0.99996	ALG1L13P, CLDN23, DEFB103A, DEFB103B, DEFB104A, DEFB

0.039543	0.99996	LINC00599, MIR124-1, MIR597, MSRA, TNKS
0.0022306	0.99996	ALG1L11P, ALG1L12P, BLK, C8orf49, CTSB, DEFB108D, DEFB
0.045231	0.99996	CHMP4C, CKS1BP7, FABP12, FABP4, FABP5, FABP9, FTH1P1
0.015441	0.99996	ABLIM1, ADRB1, AFAP1L2, ATRNL1, AURKAPS2, CASP7, CCD
0.011609	0.99996	ACP2, AGBL2, ARFGAP2, C11orf49, C1QTNF4, CBX3P8, CELF
0.028814	0.99996	DYNLL1P4, LHX5, LHX5-AS1, LINC01234, MIR6762, PLBD2, R
0.034337	0.99996	ACOD1, BTF3P11, CLN5, DHX9P1, FAM204CP, FBXL3, KCTD1
0.038727	0.99996	BHLHB9P1, CEP128, DIO2, DIO2-AS1, DYNLL1P1, DYNLL1P2,
0.018517	0.99996	ARGFXP2, C17orf75, CDK5R1, COPRS, LRRC37B, MIR193A, M
0.02215	0.99996	BDP1P, GALR1, LINC01029, RNA5SP461
0.024311	0.99994	APOBR, ATP2A1, ATP2A1-AS1, ATXN2L, CD19, CDC37P1, CD
0.038023	0.305818795	ACTRT2, ARHGEF16, CALML6, CFAP74, FAAP20, FAM213B, G
0.0028992	0.084139231	ACOT7, CAMTA1, CAMTA1-DT, CHD5, DNAJC11, ESPN, GPR1
0.0061915	0.134387301	CA6, CAMTA1, CAMTA1-IT1, ENO1, ENO1-AS1, ENO1-IT1, EF
0.021369	0.231223082	ADGRB2, BSDC1, CCDC28B, COL16A1, DCDC2B, EIF3I, FABP3
0.046761	0.334035329	ADPRHL2, AGO1, AGO3, AGO4, C1orf216, CLSPN, COL8A2, C
0.030733	0.287669696	AKR1A1, ATPAF1, CCDC163, CCDC17, CYP4B1, CYP4Z2P, DM
0.019812	0.225112188	ATP6V0E1P4, CMPK1, CYP4A11, CYP4A22, CYP4A22-AS1, CY
0.040328	0.308938027	DAB1, DAB1-AS1, HNRNPA1P6, JUN, LINC01135, MYSM1, OI
0.0045846	0.110881826	CACHD1, CFL1P3, DLEU2L, EFCAB7, ITGB3BP, JAK1, LINC013
0.020732	0.227917377	ARL5AP3, C1orf141, COX6B1P7, CTBP2P8, DEPDC1, DIRAS3,
0.046446	0.333191008	ANKRD13C, CASP3P1, CTH, HHLA3, LINC01788, LRRC40, LRR
0.0097833	0.170606029	ACTG1P21, ADGRL4, ADH5P2, AK5, DNAJB4, FUBP1, GIPC2,
0.001825	0.064556206	CTBS, DNASE2B, GNG5, LINC01555, LPAR3, PRKACB, RPF1, S
0.016655	0.198569824	LINC01661, MIR7852, MTATP6P14, MTCO1P14, NBPF4, NBP
0.038198	0.305818795	ACKR1, AIM2, APCS, CADM3, CADM3-AS1, CD1A, CD1B, CD1
0.032099	0.295064414	ABL2, ACBD6, AXDND1, CEP350, COX5BP8, EIF4A1P11, FAM
0.0042845	0.10826356	B3GALT2, CDC73, GLRX2, LINC01031, LINC01032, MIR1278,
0.038664	0.305818795	BLACAT1, C1orf186, CDK18, CNTN2, CTSE, DSTYK, ELK4, KLH
0.043691	0.320211528	AURKAPS1, BPNT1, C1orf115, DUSP10, EPRS, HDAC1P2, HLX
0.04769	0.335017303	LINC01248, LINC01249, LINC01304, NPM1P48, RNU6-649P,
0.0060889	0.133876723	LINC01376, LINC01808, MIR4757, OSR1
0.03159	0.292500443	APOB, CISD1P1, GDF7, HS1BP3, HS1BP3-IT1, LAPTM4A, LDA
0.02815	0.27547948	BCYRN1, EPCAM, FBXO11, KCNK12, MIR559, MSH2, MSH6, I
0.0011509	0.050412331	AAK1, ADD2, ANTXR1, ANXA4, ASPRV1, B3GALNT1P1, BRD7
0.029294	0.281788307	GCFC2, LRRTM4, MRPL19, RN7SKP164, RN7SKP203, RNA5SP
0.049328	0.336569749	ABCD1P5, ACTR3BP2, ANKRD20A8P, CHEK2P3, CNN2P11, CN
0.0019861	0.06751684	CNTNAP5, LINC01889, RNA5SP102, RNU6-259P
0.0011374	0.050412331	LINC01412, LINC01966, RNU7-2P, RPL17P12, RPL6P5, TEX41
0.0012833	0.054315673	FABP5P10, LINC01817, LINC01818, LINC01920, MIR4773-1,
0.015842	0.198569824	ACVR1, ACVR1C, CCDC148, CCDC148-AS1, HNRNPDLP2, PKP
0.020326	0.227893497	DPP4, EIF3EP2, FAP, GCA, GCG, IFIH1, KCNH7, RNA5SP109, F
0.0082643	0.158993863	COBLL1, GRB14, RNA5SP110, RNA5SP111, SCN3A, SLC38A11
0.037659	0.305818795	AGPS, API5P2, CYCTP, FKBP7, NFE2L2, OSBPL6, PDE11A, PJV
0.036447	0.305818795	CACYBPP2, DNAJC10, DUSP19, FRZB, KRT8P10, LIN28AP1, N
0.0017597	0.064556206	ANKAR, ASNSD1, C2orf88, CALCRL, COL3A1, COL5A2, DIRC1,
0.0094976	0.170606029	LINC01923, PLCL1, RNU7-147P, SATB2

0.00025462	0.024167575	ACSL3, AP1S3, ATG12P2, CCDC195, CUL3, DOCK10, FAM124
0.0038115	0.099274915	HDAC4, LINC01940, MIR2467, MIR4269, MIR4440, MIR4441
0.043912	0.320444034	CNTN4, CNTN4-AS1, CRBN, IL5RA, LRRN1, MRPS10P2, PNPT
0.048812	0.336569749	CAV3, LHFPL4, OR7E122P, OXTR, PGAM1P4, RAD18, SETD5,
0.030205	0.285681927	ACTG1P12, ATG7, CAND2, CHCHD4P4, CRIP1P1, CYCSP12, FA
0.00080379	0.043897305	ZNF385D, ZNF385D-AS2
0.0010838	0.050412331	CCR1, CCR2, CCR3, CCR5, CCR9, CCRL2, CXCR6, FAM240A, FL
0.00018351	0.021850987	ARIH2, ARIH2OS, ATRIP, C3orf62, C3orf84, CAMP, CCDC36, C
0.0032406	0.087968817	AKR1B1P2, CCDC75P1, CNTN3, EBLN2, FTH1P23, GXYLT2, LA
0.000794	0.043897305	LINC02077, MRPS17P3, RN7SKP61, RN7SL647P, RN7SL751P,
0.016041	0.198569824	MIR548AB, NDUFA4P2, RAP1BP2, RNU1-43P, TUBBP11
2.68E-06	0.001132363	ABHD10, ATG3, ATP6V0CP2, BTLA, C3orf52, CCDC80, CD200
0.039829	0.308341473	BZW1P2, GAP43, LINC00903, LSAMP, LSAMP-AS1, RN7SL582
0.0011613	0.050412331	ACAD9, ALG1L2, CNBP, COL6A4P2, COPG1, DNAJB8, DNAJB8
0.015085	0.198569824	ARL14, B3GALNT1, B3GAT3P1, BRD7P2, C3orf80, EEF1GP4, I
0.010328	0.170606029	LINC01192, RPS6P4, TOMM22P6
0.00040767	0.028757721	CCDC50, CCT6P4, CLDN1, CLDN16, FGF12, FGF12-AS1, GCNT
0.03744	0.305818795	ABCA11P, ATP5I, BNIP3P41, MFSD7, MIR571, MYL5, PDE6B,
0.043433	0.320211528	CYTL1, LDHAP1, LINC01396, MSX1, RN7SKP113, RN7SKP275
0.0025793	0.078440318	HS3ST1, LINC02270, LINC02360, LINC02498, MIR572, RNA5S
0.01683	0.199253077	ATP8A1, CCNL2P1, GRXCR1, LINC02383, NDUFB4P12, RN7SK
0.030755	0.287669696	GNPDA2, GUF1, KCTD8, LINC02475, PRDX4P1, YIPF7
0.037753	0.305818795	GLDCP1, HOPX, IGFBP7, IGFBP7-AS1, LINC02380, LINC02494
0.033221	0.298111323	ADGRL3, ADGRL3-AS1, LINC02271, LINC02496, MIR548AG1,
0.01481	0.198569824	ARHGAP24, C4orf36, MAPK10, MIR4451, MIR4452, PTPN13,
0.022528	0.236893814	ATOH1, CCSER1, GRID2, HMGB3P15, KRT19P6, LNCPRESS2,
1.39E-06	0.000783915	ACTR3BP4, BANK1, BDH2, CENPE, CISD2, EMCN, KRT8P46, L
0.010436	0.170606029	ALPK1, ANK2, AP1AR, CAMK2D, CCDC34P1, FAM241A, LARP
0.042025	0.317426213	LINC02502, LTV1P1, MAD2L1
0.0010109	0.050412331	BBS12, CETN4P, FGF2, IL21-AS1, LINC01091, LINC02435, NU
0.013212	0.18955861	RNU6-224P
0.001994	0.06751684	ANXA10, BTF3L4P4, CBR4, CLCN3, DDX60, DDX60L, NEK1, PA
0.049893	0.336569749	ADAM20P2, ADAM29, ASB5, CEP44, FBXO8, GLRA3, GPM6A
0.0066922	0.141623683	HSP90AA4P, LINC01060, LINC01262, LINC02508, RNU7-192P
0.033984	0.301752874	C5orf38, IRX2
0.047645	0.335017303	HMGB3P3, LINC01018, LINC02102, LINC02145, LINC02196, I
0.03794	0.305818795	BASP1, BASP1-AS1, DCAF13P2, FTH1P10, LINC02111, LINC02
0.0080363	0.156384551	CDH9, PURPL, RNU6-738P
0.00070595	0.041212874	AK4P2, ANKRD55, C1GALT1P2, C5orf67, DDX4, HMGN1P17,
0.023773	0.244016373	ANKDD1B, ANKRD31, ARHGEF28, COL4A3BP, ENC1, FAM169
5.59E-05	0.011607208	BRD8, CDC23, CDC25C, CTNNA1, EGR1, ETF1, FAM13B, FAM
0.0079846	0.156384551	C5orf46, DPYSL3, EEF1GP2, FBXO38, HMGN1P16, HTR4, JAK
0.0066087	0.141623683	CIR1P1, CNOT8, FAM114A2, FAXDC2, GALNT10, GEMIN5, GP
0.0018018	0.064556206	GABRA1, GABRA6, GABRB2, GABRG2, GLRXP3, LINC01202, P
0.016228	0.198569824	C5orf58, DOCK2, FAM196B, FOXI1, GABRP, KCNIP1, KCNMB
0.0017006	0.064556206	CD83, GFOD1, GFOD1-AS1, LINC01108, MCUR1, MRPL35P1,
0.047463	0.335017303	CAP2, DDX18P3, DEK, FAM8A1, KDM1B, KIF13A, MIR548A1,

0.0090308	0.165220416	BOLA2P3, CASC15, CDKAL1, E2F3, E2F3-IT1, ID4, KRT18P38,
0.041491	0.314996695	CASC15, HDGFL1, NBAT1, PRL, RN7SKP240
0.013828	0.195090033	RNU6-1060P, SPTLC1P2
0.0079474	0.156384551	ABCC10, ATP6V0CP3, BICRAL, C6orf132, C6orf226, CCND3, C
0.040035	0.308341473	ADGRB3
0.0010814	0.050412331	CD109, CGAS, COL12A1, COX7A2, EEF1A1, FILIP1, HMGB1P3
3.90E-07	0.000330414	BACH2, CASC6, MAP3K7, MIR4464, MIR4643, MTATP6P25, I
0.044604	0.322711846	
0.0076663	0.156374047	AMD1, BRD7P4, CDK19, CNN2P9, DDO, FAM229B, FCF1P5, F
0.0032735	0.087968817	ASF1A, CEP85L, FAM184A, MCM9, NUS1, PLN, SELENOKP3,
0.010581	0.170606029	AHI1, ALDH8A1, CHCHD2P4, COX5BP2, FAM8A6P, GAPDHP7
0.012205	0.183068735	ADAT2, ADGRG6, AIG1, FUCA2, HIVEP2, HYMAI, LINC01277,
0.011313	0.176444771	ACAT2, AIRN, AMZ2P2, C6orf99, CACYBPP3, DYNLT1, EZR, EZ
0.015604	0.198569824	KRT8P44, PACRG, PRKN
0.0058301	0.129873149	AFDN, AFDN-DT, CCR6, FGFR1OP, GPR31, KIF25, KIF25-AS1,
0.021579	0.231223082	FAM120B, MIR4644, OR4F7P, PDCD2, PSMB1, RPL23AP47, T
0.0044202	0.110049979	AMZ1, BRAT1, CHST12, EIF3B, GNA12, GRIFIN, IMMP1LP3, I
2.35E-05	0.005672276	AP5Z1, FOXK1, MIR4656, MMD2, PAPOLB, RADIL, RBAK, RBA
0.013036	0.18955861	CCNB2P1, GLCCI1, ICA1, NXPH1, RNU6-534P, UMAD1
0.015564	0.198569824	MIR3146, RPL21P75, TMEM196, TWISTNB
0.0068879	0.142348266	ABCB5, ASS1P11, CDCA7L, DNAH11, EEF1A1P27, ITGB8, LINC
0.012489	0.184065904	ANLN, AOAH, AOAH-IT1, EEPD1, ELMO1, ELMO1-AS1, KIAA0
0.037838	0.305818795	C7orf25, GLI3, HECW1, HECW1-IT1, HMGN2P30, LINC01448
0.011261	0.176444771	ADCY1, CCM2, CICP20, ELK1P1, GTF2IP13, H2AFV, IGFBP1, IG
0.022433	0.236893814	CICP17, COBL, DDC, DDC-AS1, DDX43P2, FIGNL1, GNL2P1, G
0.00084807	0.044868203	ABHD11, ABHD11-AS1, BAZ1B, BCL7B, BUD23, CASTOR2, CC
0.045559	0.328218668	ADAM22, CDK14, CFAP69, CLDN12, DBF4, DPY19L2P4, EEF1A
0.0097591	0.170606029	ARF1P1, ASB4, ATP5F1P2, BET1, CASD1, COL1A2, DYNC1I1, C
0.00028883	0.024490092	ACHE, ACTL6B, AGFG2, AP1S1, C7orf61, EPHB4, EPO, FBXO2
0.026492	0.263829153	DOCK4, DOCK4-AS1, EIF3IP1, IFRD1, IMMP2L, LRRN3, LSMEM
0.010173	0.170606029	ARHGEF34P, ARHGEF35, ARHGEF5, CASP2, CLCN1, CTAGE15
0.025578	0.256234047	DPP6, PAXIP1, PAXIP1-AS2
0.048133	0.336569749	ESYT2, LINC00689, LINC01022, MIR5707, MIR595, NCAPG2,
0.016311	0.198569824	C8orf74, LINC00529, MIR1322, MIR4286, MIR598, PINX1, PP
0.029119	0.281705526	ALG1L11P, ALG1L12P, BLK, C8orf49, CTSB, DEFB108D, DEFB1
0.01136	0.176444771	CDCA2, DOCK5, GNRH1, KCTD9, MIR6841, MIR6876, NEFL, N
0.0047846	0.114089124	ADRA1A, CCDC25, CHRNA2, CLU, COX6B1P4, ELP3, EPHX2, E
0.038192	0.305818795	RNA5SP267, TOX
0.032955	0.298111323	CSMD3, MIR2053, RNU4-37P, RPL30P16
0.043612	0.320211528	AARD, COLEC10, CYCSP23, EIF3H, ENPP2, EXT1, LINC00536,
0.0096456	0.170606029	KNOP1P5, LINC00861, RFPL4AP5, RNU6-442P, SOD1P3
0.00016678	0.021719888	CASC11, CASC19, CASC21, CASC8, CCAT2, FAM84B, LINC008
0.017643	0.207427771	MTCO1P49, MTND2P7, ST13P6, ST3GAL1, ZFAT
0.040068	0.308341473	LINC02055, RNU6-144P, ZYXP1
0.027584	0.271509953	COL22A1, FAM135B
0.00053527	0.034854312	C9orf66, CBWD1, DDX11L5, DMRT1, DMRT2, DMRT3, DOCK
0.00010099	0.017097607	DMAC1, KDM4C, PPIAP33, PTPRD, RPL4P5

0.015061	0.198569824	ATP5HP3, CDCA4P1, CER1, FREM1, JKAMPP1, LINC00583, LI
0.014792	0.198569824	BNC2, C9orf92, CCDC171, CLCN3P1, FREM1, FTH1P12, HMG
0.036612	0.305818795	ME2P1, MIR873, MIR876
0.036552	0.305818795	HMGB3P23, LINC01243, MTATP6P30, MTCO3P30
0.015548	0.198569824	ASPN, AUH, BEND3P2, CENPP, DIRAS2, ECM2, HSPE1P22, IA
0.0053955	0.123440291	ALOX15P2, ANKRD19P, BARX1, BARX1-AS1, BICD2, C9orf129
0.00028931	0.024490092	AAED1, C9orf3, CDC14B, EIF4BP3, ERCC6L2, FANCC, FBP1, FI
0.022214	0.236530201	ANKRD18CP, ANKS6, ANP32B, CCDC180, CORO2A, CTSV, FAI
0.027177	0.269068193	DEC1, TNC, TNFSF8
0.016011	0.198569824	ASTN2, ASTN2-AS1, LINC00474, PAPPA, PAPPA-AS1, PAPPA-
0.0010176	0.050412331	ASTN2, RN7SKP125, RN7SKP128, RNU6-1082P, RPL10P3, RP
0.010167	0.170606029	ADGRD2, ARPC5L, CRB2, DENND1A, GPR21, KRT18P67, LHX2
0.0050257	0.118173751	ABL1, AIF1L, ASS1, EIF4A1P3, EXOSC2, FAM78A, FIBCD1, FUI
0.043383	0.320211528	ABO, ADAMTS13, ADAMTSL2, ARF4P1, BRD3, BRD3OS, CACI
0.016372	0.198569824	ABCA2, AGPAT2, ATP6V1G1P3, C8G, C9orf116, C9orf139, C9
0.036811	0.305818795	ARRDC1, ARRDC1-AS1, CACNA1B, EHMT1, FAM157B, MIR60
0.038565	0.305818795	ADARB2, ADARB2-AS1, LINC00700, MIR6072, RNU6-576P, R
0.0090759	0.165220416	ABI1, APBB1IP, FAM238A, FAM238B, GAD2, GPN3P1, GPR15
0.049025	0.336569749	ACBD5, ANKRD26, ARMC4, ARMC4P1, BAMBI, C10orf126, FA
0.0042784	0.10826356	AK3P5, ARHGAP12, C1DP1, CCDC7, EPC1, HMGB1P7, ITGB1,
0.039974	0.308341473	ATP6V1G1P4, CCNY, CREM, FZD8, GJD4, MIR4683, MTND4P
0.0025946	0.078440318	GAPDHP21, MTRNR2L5, PCDH15, ZWINT
6.17E-05	0.011607208	ANXA2P3, CYP2C61P, DBF4P1, JMJD1C, JMJD1C-AS1, LINC01
0.03837	0.305818795	ABCC2, ARL5AP2, CHUK, CNNM1, COX15, CPN1, CRTAC1, CU
0.037077	0.305818795	BLOC1S2, CWF19L1, HIF1AN, NDUFB8, OLMALINC, PHBP9, P
0.0018303	0.064556206	LINC01435, PTGES3P5, RNA5SP325, RNA5SP326, SORCS1
0.032245	0.295064414	ADD3, ADD3-AS1, BTF3P15, MAPKAPK5P1, MXI1, PHB2P1, R
0.038279	0.305818795	CSNK2A3, DKK3, GALNT18, LINC02547, MICAL2, MICALCL, M
0.020649	0.227917377	ARNTL, BTBD10, CALCA, CALCB, CALCP, CENPUP1, COPB1, C
0.035615	0.305818795	ABCC8, AKR1B1P3, C11orf58, KCNJ11, MIR6073, NCR3LG1, N
0.0037547	0.099274915	BBOX1, BBOX1-AS1, BDNF, BDNF-AS, CBX3P1, CCDC34, HSP9
0.035406	0.305818795	C11orf74, COMMD9, FJX1, KRT18P14, LDLRAD3, MIR3973, P
0.041385	0.314996695	CNTF, GLYAT, LPXN, OR5B21, ZFP91, ZFP91-CNTF
0.028371	0.276046569	ARRB1, CHRDL2, CYCSP27, DGAT2, EMSY, GDPD5, GUCY2EP,
0.014941	0.198569824	
0.013515	0.192276429	OSBPL9P2, OSBPL9P3, TUBB4BP4
0.00059692	0.036209038	C11orf65, C11orf87, CYCSP29, DDX10, EXPH5, KDELC2, RNA5
0.015588	0.198569824	C11orf71, NNMT, NXPE1, NXPE2, NXPE2P1, NXPE4, RBM7, R
0.010541	0.170606029	ATP5F1P5, BSX, CLMP, CRTAM, GLULP3, GRAMD1B, HSPA8,
0.010279	0.170606029	ACRV1, CCDC15, CDON, CHEK1, DCPS, DDX25, EI24, ESAM, F
0.0001936	0.021850987	DCPS, GSEC, KIRREL3, KIRREL3-AS1, KIRREL3-AS2, KIRREL3-A
0.0024112	0.078440318	NTM, NTM-AS1, NTM-IT, OPCML, OPCML-IT2, RNU6ATAC12
0.021004	0.229417884	ADIPOR2, CACNA1C, CACNA1C-AS4, CACNA1C-IT1, CACNA1C
0.0028569	0.084139231	CACNA1C, CACNA1C-AS1, CACNA1C-AS2, CACNA1C-AS3, CB
0.00047778	0.032355262	CCND2, CCND2-AS1, CRACR2A, FGF23, HSPA8P5, OTUD4P1,
0.035722	0.305818795	APOLD1, ARHGDIB, ART4, ATF7IP, C12orf60, DDX47, EMP1,
0.0084159	0.160091221	EEF1A1P16, LINC02378, LMO3, MGST1, MIR3974, PSMC1P8

0.00059885	0.036209038	ABCD2, C12orf40, CNTN1, KIF21A, LINC02471, LINC02555, L
0.013153	0.18955861	CNTN1, PDZRN4
0.00038519	0.028353333	AQP2, AQP5, AQP6, ASIC1, ATF1, BCDIN3D, BCDIN3D-AS1, B
0.0013196	0.054489824	AGAP2, AGAP2-AS1, ARHGEF25, ATP23, AVIL, B4GALNT1, CD
0.0024872	0.078440318	
0.011715	0.1803045	CCDC60, CIT, HSPB8, LINC02423, LINC02439, LINC02440, LIN
0.019015	0.217516182	GLT1D1, LINC00507, LINC00508, LINC02368, LINC02369, LIN
0.020244	0.227893497	ADGRD1, ADGRD1-AS1, LINC01257, LINC02370, LINC02414,
0.016573	0.198569824	GAPDHP69, HMGB1, KATNAL1, LINC00297, LINC00365, LINC
0.018999	0.217516182	DCLK1, LINC00445, MAB21L1, NBEA, PHBP13, SCAND3P1
6.61E-06	0.001864332	AKAP11, CALM2P3, CHCHD2P11, DGKH, DNAJC15, EPSTI1, F
0.0029322	0.084139231	CCDC122, DGKZP1, DNAJC15, ENOX1, ENOX1-AS1, ENOX1-A
0.03328	0.298111323	ESD, FKBP1AP3, GNG5P5, HTR2A, HTR2A-AS1, LRCH1
0.02953	0.282453616	DIAPH3, DIAPH3-AS1, DIAPH3-AS2, EIF4A1P6, LINC00378, LI
0.025093	0.25287172	LINC00358, LINC00376, LINC00395, LINC00448, LINC00459,
0.038804	0.305818795	BCRP9, HNRNPA3P5, LINC00364, LINC01052, MIR4704, MIR
0.0086868	0.161612664	BORA, DACH1, DIS3, FABP5P1, H3F3BP1, KLF12, KLF5, LINC0
0.034043	0.301752874	FAM155A, FAM155A-IT1, MIR1267, PPIAP24, SNORD31B
0.049849	0.336569749	ARHGEF7, LINC00354, LINC00404, LINC01070, LINC02337, S
0.01115	0.176444771	NRXN3
0.00012991	0.01999433	BHLHB9P1, CEP128, DIO2, DIO2-AS1, DYNLL1P1, DYNLL1P2,
0.012503	0.184065904	ASB2, BTBD7, CCDC197, COX8C, DDX24, FAM181A, FAM181
0.044448	0.322711846	BDKRB1, BDKRB2, C14orf132, CKS1BP1, TUNAR
0.016612	0.198569824	AK7, ATG2B, BDKRB1, GSKIP, LINC00618, LINC01550, LINC02
0.042186	0.317426213	ANKRD63, BMF, BMF-AS1, BUB1B, BUB1B-PAK6, C15orf52, C
0.042628	0.319332761	ACTBP7, ADAL, ATP5HP1, CATSPER2, CATSPER2P1, CCNDBP1
0.023887	0.244016373	ARPP19, BCL2L10, CERNA1, EEF1A1P22, EEF1B2P1, FAM214
0.020502	0.227917377	C15orf65, CCPG1, CD24P2, CNOT6LP1, DNAAF4, DNAAF4-CC
0.00016289	0.021719888	ANKDD1A, APH1B, CA12, CSNK1G1, DAPK2, FAM96A, FBXL2
0.023682	0.244016373	ADAMTS7P4, AGBL1, AGBL1-AS1, AKAP13, ALPK3, CSPG4P1
0.0492	0.336569749	BLM, CRTC3, CRTC3-AS1, FES, FURIN, HDDC3, HSPE1P3, IQG
0.038837	0.305818795	ALDH1A3, ASB7, CHSY1, LRRK1, PCSK6, PCSK6-AS1, SELENOS
0.049899	0.336569749	ENPP7P14, LINC01570, LINC02164, MIR8065, RBFOX1, SNRP
0.00023521	0.024167575	ABAT, C16orf72, CARHSP1, GRIN2A, LINC01177, LINC01195,
0.0029929	0.084449662	ATF7IP2, CIITA, CLEC16A, DEXI, EMP2, HNRNPCP4, LINC012
0.0086778	0.161612664	APOBR, ATP2A1, ATP2A1-AS1, ATXN2L, CD19, CDC37P1, CD
0.048487	0.336569749	ABCD1P3, ABHD17AP7, ABHD17AP8, ABHD17AP9, ACTR3BP
0.039679	0.308341473	ACTG1P16, ADAM3B, ADCY7, BRD7, C16orf78, C16orf97, CB
0.014278	0.198136508	DNAH9, MAP2K4, MIR744, RN7SL601P, RNU11-2P, RPL21P1
0.04329	0.320211528	AATF, ACACA, ARHGAP23, C17orf78, C17orf98, CISD3, CWC2
0.0017544	0.064556206	ACBD4, ADAM11, ARHGAP27, ARL4D, ASB16, ASB16-AS1, AT
0.047681	0.335017303	AKAP1, ANKFN1, C17orf67, COIL, DGKE, GARSP1, MIR3614,
0.029862	0.284024528	APPBP2, BCAS3, C17orf64, C17orf82, CA4, CLTC, DHX40, DH
0.0016697	0.064556206	BRIP1, EFCAB3, INTS2, MARCH10, MED13, METTL2A, MIR63
0.002356	0.078209961	AANAT, CYCSP40, CYGB, JMJD6, LINC00868, LINC02080, ME
0.023926	0.244016373	BOD1P1, DLGAP1, DLGAP1-AS1, DLGAP1-AS2, DLGAP1-AS3,
0.031617	0.292500443	ARHGAP28, L3MBTL4, L3MBTL4-AS1, LAMA1, LINC00668, LI

0.024516	0.248536455	B4GALT6, DSC1, DSC2, DSC3, DSCAS, DSG1, DSG1-AS1, DSG2
0.0044959	0.110312445	C18orf54, CCDC68, DCC, DYNAP, LINC01630, LINC01917, LIN
0.011935	0.182035631	ATP5G1P6, HMSD, LINC00305, LINC01538, LINC01924, RPL1
0.012219	0.183068735	C18orf63, CNDP1, CNDP2, CYB5A, FAM69C, FAUP1, FBXO15
0.0025424	0.078440318	ACTL9, ADAMTS10, ANGPTL4, BOLA3P2, ELOCP29, HNRNPM
0.015358	0.198569824	BNIP3P34, BNIP3P35, BNIP3P36, BNIP3P37, BNIP3P38, BNIP
0.032417	0.295064414	CCNE1, PPIAP58, RPL9P32, TAF9P3, URI1, ZNF536
0.0032483	0.087968817	AP2S1, ARHGAP35, CALM3, CCDC8, DACT3, DACT3-AS1, FKR
0.00025695	0.024167575	A1BG, A1BG-AS1, C19orf18, CENPBD1P1, CHMP2A, ERVK3-1
0.021517	0.231223082	C20orf96, CSNK2A1, DEFB125, DEFB126, DEFB127, DEFB128
0.01635	0.198569824	ACTG1P3, ANGPT4, C20orf202, FAM110A, FKBP1A, MIR6869
0.0057404	0.129579963	ADRA1D, AP5S1, CDS2, FTLP3, LINC00658, LINC01433, MAVS
0.0078718	0.156384551	GAPDHP2, ISM1, ISM1-AS1, LINC01722, LINC01723, SPTLC3,
0.0051214	0.118774386	DYNLT3P1, KIF16B, MACROD2, OTOR, PCSK2, PPIAP17, RNU
0.01039	0.170606029	CFAP61, CRNKL1, EIF4E2P1, INSM1, LLPHP1, MRPS11P1, NA
0.034369	0.303055818	GSTM3P1, KIZ, KIZ-AS1, LINC00237, LINC01427, LINC01432,
0.017802	0.207853697	CHD6, PTPRT, RNU6-1018P
0.00035438	0.027271152	BTF3L4P1, BTG3, BTG3-AS1, C21orf91, C21orf91-OT1, CHOD
0.023713	0.244016373	LINC00317, LINC01425, LINC01687, NCAM2
6.49E-06	0.001864332	C21orf59, EVA1C, EXOSC3P1, FBXW11P1, HMGN1P2, HUNK,
2.92E-07	0.000330414	C21orf58, DIP2A, DIP2A-IT1, DSTNP1, LSS, MCM3AP, MCM3
0.038419	0.305818795	BCRP7, C22orf39, CA15P1, CA15P2, CDC45, CLDN5, CLTCL1,
0.049089	0.336569749	ABHD17AP4, ABHD17AP5, AIFM3, ARVCF, ASH2LP3, BCRP2,
0.018813	0.217516182	ASH2LP1, ASH2LP2, ASLP1, BCR, BCRP4, BCRP8, CES5AP1, DI
0.013977	0.195562488	APOL1, APOL2, APOL3, APOL4, APOL5, APOL6, C1QTNF6, CA
0.0068946	0.142348266	ACO2, ATP5L2, C22orf46, CCDC134, CENPM, CHADL, COX6B
0.0003302	0.02662041	A4GALT, ARFGAP3, BIK, EFCAB6, EFCAB6-AS1, GOLGA2P4, LI
0.011986	0.174496479	ACTRT2, ARHGEF16, CALML6, CFAP74, FAAP20, FAM213B, G
0.017217	0.2113386	ALPL, CAMK2N1, CDA, CROCCP5, DDOST, ECE1, EIF4G3, FAM
8.60E-06	0.0029149	ACTG1P20, ARID1A, AUNIP, C1orf232, CATSPER4, CD164L2,
0.00044706	0.037441635	ADGRB2, BSDC1, CCDC28B, COL16A1, DCDC2B, EIF3I, FABP3
0.028533	0.271604667	ATP6V0E1P4, CMPK1, CYP4A11, CYP4A22, CYP4A22-AS1, CY
0.038192	0.288988871	FGGY, HOOK1, LINC01135, LINC01358, MIR4711, PHBP3
0.0029831	0.088655639	C1orf87, CYP2J2, LINC01748, NFIA, NFIA-AS1, NFIA-AS2, PAT
0.0068125	0.1314929	ACADM, ASB17, CRYZ, DLSTP1, ERICH3, ERICH3-AS1, FPGT-T
0.039854	0.292688746	DPYD, FRRS1, HMGB3P10, LINC01708, LINC01776, LINC0193
0.031814	0.271604667	AGL, BCAS2P2, BRI3P1, CDC14A, DBT, GPR88, LINC01349, LR
0.017807	0.213936582	CDK4P1, FTLP17, LINC01676, LINC01677, SEPT2P1
0.045171	0.312982057	LINC01661, MIR7852, MTATP6P14, MTCO1P14, NBPF4, NBP
0.03929	0.292688746	AKR7A2P1, CAPZA1, CTTNBP2NL, DDX20, FAM19A3, FAM21
0.028091	0.270375875	ARHGEF11, BCAN, C1orf61, CCT3, CD5L, CRABP2, CYCSP52, I
0.018101	0.213938083	ATP1B1, BLZF1, C1orf112, CCDC181, F5, GORAB, HAUS4P1, I
0.0027628	0.0835747	CACNA1E, EIF1P3, GLUL, LINC00272, LINC01344, LINC01686
8.94E-05	0.013774684	APOBEC4, ARPC5, C1orf21, COLGALT2, DHX9, HMGN1P4, KR
0.032242	0.271604667	EEF1A1P14, LINC01724, RNU6-983P
0.00049493	0.037441635	ASCL5, CACNA1S, CAMSAP2, CSRP1, DDX59, FAM58BP, GPR
0.0063082	0.1281874	ANGEL2, FLVCR1, FLVCR1-AS1, KRT18P12, LINC00538, PROX

0.040725	0.292688746	CHRM3, CHRM3-AS1, CHRM3-AS2, MIPEPP2
0.047743	0.319670522	BECN2, CFL1P4, CHML, EXO1, KMO, MAP1LC3C, OPN3, RPL2
0.031216	0.271604667	ADSS, C1orf100, CATSPERE, COX20, CYCSP5, DESI2, DNAJC1
0.020299	0.224015	LINC01248, LINC01249, LINC01304, NPM1P48, RNU6-649P,
0.025029	0.255416422	FAM49A, GEN1, KCNS3, LINC01866, MSGN1, NT5C1B, NT5C
0.036395	0.284115806	ADCY3, ADGRF3, ASXL2, C2orf70, CDKN2AIPNLP2, CENPA, C
0.036208	0.283964593	CAMKMT, EPAS1, LINC01121, LINC01820, LINC01833, PREPL
0.014049	0.191927468	LINC01122, LINC01793, RNA5SP94, RNU6-508P
0.0072021	0.13420715	ANTXR1, APLF, ARHGAP25, BMP10, C1D, CNRIP1, FBXO48, G
0.00017793	0.02152953	C2orf40, C2orf49, FHL2, GPR45, LINC01918, NCK2, TGFBRAP
0.0043658	0.109448211	ACOXL, ACOXL-AS1, ACTR3, ANAPC1, BCL2L11, BUB1, CBWD
0.041662	0.296798765	AMER3, ANKRD30BL, ARHGAP42P1, ARHGEF4, C2orf27A, C2
0.00019874	0.022444371	LINC01412, LINC01966, RNU7-2P, RPL17P12, RPL6P5, TEX41
0.045266	0.312982057	BAZ2B, CD302, ITGB6, KRT18P46, LINC01806, LY75, LY75-CD
0.0087865	0.153912	DNAJC19P5, EVX2, EXTL2P1, FUCA1P1, HAGLR, HAGLROS, H
0.003705	0.101230161	C2orf88, CAVIN2, DNAJB1P1, GLS, HIBCH, HMGB1P27, HNRN
0.031727	0.271604667	ANKRD44, ANKRD44-IT1, ATP5G2P3, BOLL, C2orf66, CCDC15
0.024654	0.2531144	LINC01923, PLCL1, RNU7-147P, SATB2
0.0031001	0.0905443	AAMP, ARPC2, CATIP, CATIP-AS1, CATIP-AS2, CXCR1, CXCR2,
0.0013007	0.052461567	DNER, LINC01807, PID1, RN7SKP283, RNU6-624P, RPL7L1P1
0.033153	0.271604667	HDAC4, LINC01940, MIR2467, MIR4269, MIR4440, MIR4441
0.0026719	0.08335404	GRM7, GRM7-AS1, LMCD1, LMCD1-AS1, RNU4ATAC17P, SSU
0.0078636	0.141712111	CAV3, LHFPL4, OR7E122P, OXTR, PGAM1P4, RAD18, SETD5,
0.00013623	0.017751817	CDYLP1, DAZL, LINC00690, MIR3714, OXNAD1, PDCL3P3, PL
0.0009433	0.047738751	ZNF385D, ZNF385D-AS2
0.021438	0.229847924	CCR4, CMTM6, CMTM7, CMTM8, CNOT10, CNOT10-AS1, CR
0.016416	0.20871597	ACVR2B, ACVR2B-AS1, CCR8, CSRNP1, CX3CR1, DDTP1, DSTN
0.036181	0.283964593	APPL1, ARF4, ARF4-AS1, ARHGEF3, ARHGEF3-AS1, ASB14, C(
0.036868	0.285179872	ABHD6, ACOX2, C3orf67, C3orf67-AS1, DNASE1L3, FAM107A
0.0023024	0.079086084	CADPS, FEZF2, KRT8P35, LINC00698, PTPRG-AS1, RN7SL863I
0.0096052	0.159521655	ARL6, CDV3P1, CRYBG3, EPHA6, GABRR3, HNRNPKP4, MIR8(
0.0072887	0.13420715	ATP6V1A, BOC, CD200R1, CD200R1L, CFAP44, CFAP44-AS1,
0.0036993	0.101230161	ADCY5, CASR, CCDC58, CD86, CSTA, DIRC2, DTX3L, EIF4BP8,
0.032685	0.271604667	ABTB1, C3orf22, C3orf56, CCDC37-AS1, CFAP100, CHCHD6, (
0.011273	0.172971135	ACAD9, ALG1L2, CNBP, COL6A4P2, COPG1, DNAJB8, DNAJB8
0.0047242	0.109448211	ASTE1, ATP2C1, BCL2L12P1, COL6A4P2, COL6A5, COL6A6, C
0.0235	0.245734568	CLRN1, CLRN1-AS1, EIF2A, ERICH6, ERICH6-AS1, GPR171, GP
0.038989	0.292244982	LINC01192, LINC01323, LINC01324, MIR1263, RNU7-82P, SI
0.0070694	0.13420715	ATP5G1P4, BZW1P1, ECT2, FNDC3B, GHSR, LINC02068, NCE
0.04739	0.318841722	ASS1P7, LINC00501, LINC00578, LINC01208, LINC01209, LIN
0.0040236	0.1032724	CEP19, DLG1, FBXO45, LINC00885, LINC01063, MELTF, MELT
0.00051875	0.037441635	CPLX1, CTBP1, CTBP1-AS, CTBP1-AS2, DGKQ, FGFRL1, GAK, I
0.012344	0.177209627	ELOCP33, FAM114A1, KLB, KLHL5, KRT18P25, LIAS, MIR5591
0.031255	0.271604667	ATP8A1, CCNL2P1, GRXCR1, LINC02383, NDUFB4P12, RN7SK
0.0405	0.292688746	GNPDA2, GUF1, KCTD8, LINC02475, PRDX4P1, YIPF7
0.040659	0.292688746	DPP3P1, EFTUD1P2, EPHA5, EPHA5-AS1, LINC02232, MIR12(
0.0025409	0.081212917	ABCG2, CHCHD2P7, DMP1, DSPP, FAM13A, FAM13A-AS1, G

0.028886	0.271604667	BMPR1B, BMPR1B-AS1, HPGDS, PDHA2, PDLIM5, RNU6-105
0.011593	0.173792407	ACTR3BP4, BANK1, BDH2, CENPE, CISD2, EMCN, KRT8P46, L
0.026896	0.264904174	CXXC4, CXXC4-AS1, DDX3P3, LINC02428, LINC02503, RN7SL8
0.035226	0.278845065	ADAD1, ANXA5, BBS7, CCNA2, EXOSC9, IL2, IL21, IL21-AS1, K
0.0012843	0.052461567	AARSP1, ELL2P2, LINC01256, LINC02377, RN7SL205P, RPL7A
0.017466	0.2113386	LINC00498, LINC00499, LINC00500, LINC00616, LINC02172,
0.016431	0.20871597	AKIRIN2P1, ASS1P8, ATP5LP4, DCLK2, IQCM, LINC02355, LIN
0.03805	0.288988871	AK4P6, ARFIP1, FAM160A1, FAM160A1-DT, FBXW7, FBXW7-
0.038384	0.288988871	APELA, CPE, FAM218A, FAM218BP, GK3P, HADHAP1, KLHL2,
0.039861	0.292688746	AGA, LINC01098, LINC01099, LINC02509, NEIL3, RN7SKP136
0.0078032	0.141712111	AGGF1P1, CLUHP4, DBET, DUX4, DUX4L1, DUX4L2, DUX4L3,
0.0058065	0.122952638	IRX1, LINC01017, LINC01019, LINC02063, LINC02162
0.0038543	0.1032724	ADAMTS16, ALG3P1, ICE1, LINC01020, LINC02114, LINC021
0.00042425	0.037441635	LINC02112, LINC02199, LINC02226, MIR4458, MIR4458HG,
0.0023343	0.079086084	BASP1, BASP1-AS1, DCAF13P2, FTH1P10, LINC02111, LINC0
0.021697	0.230193425	BTG4P1, C5orf17, CDH10, LINC02211, LINC02228, LINC0223
0.00065843	0.041967035	LINC02064, LINC02103, LINC02109, LSP1P3, RNU6-909P, SU
0.018593	0.21426219	C5orf42, C8orf59P2, EGFLAM, EGFLAM-AS1, EGFLAM-AS2, E
0.043609	0.306529651	C6, C7, CARD6, MROH2B, OXCT1, OXCT1-AS1, PLCXD3, PRKA
0.043983	0.307881	AK4P2, ANKRD55, C1GALT1P2, C5orf67, DDX4, HMGN1P17,
0.001183	0.051384667	AGGF1, ALDH7A1P1, BIN2P2, CRHBP, F2R, F2RL1, F2RL2, HM
0.00067372	0.041967035	CETN3, LINC01339, LINC02161, MEF2C, MEF2C-AS1, MIR366
0.032714	0.271604667	RAB9BP1
0.0095762	0.159521655	FER, GJA1P1, KRT18P42, LINC01023, LINC01848, MAN2A1, M
0.03462	0.277895531	KCNN2, LINC01957, MCC, RN7SKP89, RNU4ATAC13P, TSSK1
0.004557	0.109448211	C5orf58, DOCK2, FAM196B, FOXI1, GABRP, KCNIP1, KCNMB
0.00027655	0.029279731	FOXC1, FOXCUT, GMDS, GMDS-AS1, HMGN2P28, RN7SL352
0.0057667	0.122952638	C6orf201, ECI2, FAM217A, FAM50B, GLRX3P2, LINC02533, P
0.0046032	0.109448211	CD83, GFOD1, GFOD1-AS1, LINC01108, MCUR1, MRPL35P1,
0.017394	0.2113386	CAP2, DDX18P3, DEK, FAM8A1, KDM1B, KIF13A, MIR548A1,
0.00069367	0.041967035	ACOT13, ALDH5A1, C6orf229, C6orf62, DCDC2, GMNN, GPLI
0.011289	0.172971135	AARS2, C6orf223, CAPN11, CDC5L, HSP90AB1, LINC02537, M
0.033594	0.273597288	GAPDHP15, GAPDHP41, GUSBP4, KHDRBS2, LINC00680, MT
0.042251	0.299469431	CD109, CGAS, COL12A1, COX7A2, EEF1A1, FILIP1, HMGB1P3
0.030609	0.271604667	DOPEY1, IBTK, LAP3P1, LINC02542, RNU6-130P, TPBG, UBE3
0.013728	0.189066927	
0.031393	0.271604667	
1.92E-06	0.000815195	ATG5, BEND3, C6orf203, CD24, CRYBG1, LINC02526, LINC02
0.0068308	0.1314929	CALHM4, CALHM5, CALHM6, CBX3P9, COL10A1, DCBLD1, DS
0.026358	0.264203858	FAM184A, MAN1A1, MIR548B, RNU6-194P
0.020317	0.224015	COX6A1P3, GJA1, HMGB3P18, RNA5SP215, RNU2-8P, RNU4
0.040776	0.292688746	ABRACL, ATP5F1P6, CCRL1P1, CITED2, ECT2L, HECA, LINC01(
4.05E-05	0.008567829	ARID1B, GTF2H5, HSPE1P26, LDHAL6FP, MIR3692, MIR4466
0.030584	0.271604667	KRT8P44, PACRG, PRKN
0.0001066	0.015048367	AFDN, AFDN-DT, CCR6, FGFR1OP, GPR31, KIF25, KIF25-AS1,
0.010633	0.171545733	C6orf120, DLL1, ERMARD, FAM120B, LINC00242, LINC00574
0.047431	0.318841722	AMZ1, CARD11, CYP3A54P, GNA12, RN7SKP130, SDK1

0.015209	0.202866504	MTND4P3, RNA5SP231
0.019347	0.21849212	AUTS2, CALN1, GALNT17, MIR3914-1, MIR3914-2, MTCO1P2
0.041699	0.296798765	ABCF2P2, CALN1, FKBP6, GTF2IP4, GTF2IRD2P1, MIR4650-2,
0.012509	0.178069294	ADAM22, CDK14, CFAP69, CLDN12, DBF4, DPY19L2P4, EEF1A
0.02456	0.2531144	AKAP9, ANKIB1, CDK14, CYP51A1, CYP51A1-AS1, ERVW-1, F
0.012007	0.174496479	AASS, ASB15, CADPS2, FEZF1, FEZF1-AS1, HYAL4, HYALP1, IC
0.0017458	0.065719671	ARF5, CALU, CICP14, FAM71F1, FAM71F2, FSCN3, GCC1, GR
0.028039	0.270375875	CHCHD3, COX5BP3, EXOC4, LRGUK, MIR3654, MIR6133, RNU
0.011587	0.173792407	CNTNAP2, DUTP3, MIR548F4, RANP2
0.010825	0.172866426	ABCB8, ABCF2, AGAP3, AOC1, ASB10, ASIC3, ATG9B, BET1P1
0.048199	0.321453173	ACTR3B, ATP5F1P3, CCT8L1P, FABP5P3, KMT2C, LINC01003,
0.0045211	0.109448211	CSMD1
0.021742	0.230193425	CSMD1, RNA5SP251
0.046252	0.318499545	ALG1L13P, CLDN23, DEFB103A, DEFB103B, DEFB104A, DEFB
0.026897	0.264904174	RNU6-1151P, RNU6-526P, TNKS
0.020343	0.224015	LINC00599, MIR124-1, MIR597, MSRA, TNKS
2.07E-07	0.000175363	ALG1L11P, ALG1L12P, BLK, C8orf49, CTSB, DEFB108D, DEFB1
0.00605	0.12652716	KCTD9P6, WRN
0.0048457	0.109448211	ATP6V1H, LYPLA1, MRPL15, RGS20, RNU105C, RNU6-1331P,
0.020365	0.224015	ANKRD46, COX6C, DUXAP2, FBXO43, GAPDHP62, GRHL2, M
0.046927	0.318841722	ADI1P2, ATP6V1C1, AZIN1, AZIN1-AS1, BAALC, BAALC-AS1, E
0.029946	0.271604667	ANGPT1, EIF3E, EMC2, NRBF2P4, PGAM1P13, RNA5SP275, R
0.0047309	0.109448211	KHDRBS3, LINC01591, MAPRE1P1, MIR30B, MIR30D, RNU1-
0.047205	0.318841722	ADCK5, ARHGAP39, BOP1, C8orf33, C8orf82, COMMD5, CPS
0.019116	0.217332242	DMAC1, KDM4C, PPIAP33, PTPRD, RPL4P5
0.00042019	0.037441635	CLIC4P1, DMRTA1, ELAVL2, LINC01239, NOP56P2, SUMO2P2
0.014606	0.197740889	ABHD17B, ANKRD20A1, ANKRD20A3, APBA1, AQP7P3, ATP5
0.029642	0.271604667	RPS20P24, RPS27AP15, TMC1
0.0088828	0.153912	DDX10P2, MTCO3P40, RNA5SP287, RNU6-1035P, RPS20P25
0.013593	0.188742148	C9orf64, FRMD3, GKAP1, HNRNPK, IDNK, KIF27, MIR7-1, RA
5.14E-05	0.009674999	NTRK2, SLC28A3, UBE2V1P10
0.032322	0.271604667	ANKRD18CP, ANKS6, ANP32B, CCDC180, CORO2A, CTSV, FA
0.0007919	0.044715953	ARL2BPP7, CYLC2, GRIN3A, LINC00587, LINC01492, MTND3P
0.013075	0.18305	AKAP2, C9orf152, EPB41L4B, MIR3927, MTND2P11, MUSK,
4.90E-08	8.29E-05	AIFM1P1, ARL5B, CACNB2, HMGN1P20, MALRD1, NSUN6, R
0.00099366	0.047738751	MIR548F1, NEFMP1, PCDH15, RNU6-687P
0.033189	0.271604667	ANK3, ARL4AP1, CABCOCO1, CDK1, LINC00845, RHOBTB1, R
0.029494	0.271604667	ACTA2, ACTA2-AS1, ANKRD22, FAS, KRT8P38, LIPF, LIPJ, LIPK
0.0039624	0.1032724	
0.043273	0.305435258	ANO9, AP2A2, B4GALNT4, BET1L, CD151, CDHR5, CEND1, CH
0.0021621	0.076304113	APBB1, ARFIP2, DCHS1, DNHD1, GVINP1, GVINP2, HPX, ILK,
0.012816	0.1809192	ADM, AMPD3, CTR9, DENND5A, EIF4G2, IPO7, KRT8P41, LYV
0.015895	0.20871597	CSRP3, E2F8, GLTPP1, GTF2H1, HIGD1AP5, HPS5, IGSF22, KC
0.00046434	0.037441635	BBOX1, BBOX1-AS1, BDNF, BDNF-AS, CBX3P1, CCDC34, HSP9
0.021407	0.229847924	ARAP1, ARAP1-AS1, ARAP1-AS2, ARHGEF17, ART2BP, ART2P
0.024199	0.251491448	AAMDC, ACER3, ALG8, AQP11, B3GNT6, CAPN5, CLNS1A, FT
0.0047979	0.109448211	LINC02553, RNA5SP347

0.0072639	0.13420715	ARHGAP20, FDX1, HNRNPA1P60, LINC02550, RDX, RNA5SP3
0.0010427	0.047738751	ABCG4, ARCN1, ATP5L, BCL9L, C2CD2L, CBL, CCDC153, CCDC
0.00031571	0.031459573	BLID, BMPR1APS2, MIR100, MIR100HG, MIR125B1, MIRLET
0.011021	0.172866426	NTM, NTM-AS1, NTM-IT, OPCML, OPCML-IT2, RNU6ATAC12
0.012052	0.174496479	AK4P3, AMN1, BICD1, CAPRIN2, DDX11, DDX11-AS1, DENND
0.040064	0.292688746	CNTN1, PDZRN4
0.046607	0.318841722	ADCY6, ANP32D, ARF3, ASB8, C12orf54, CACNB3, CCDC184,
0.040272	0.292688746	AQP2, AQP5, AQP6, ASIC1, ATF1, BCDIN3D, BCDIN3D-AS1, B
0.0039845	0.1032724	AAAS, AMHR2, ATF7, ATP5G2, C12orf10, CALCOCO1, CBX5,
0.018172	0.213938083	LINC02448, RNU4-20P, RNU6-279P, RNU6-871P, SLC16A7
0.0034748	0.099457563	CDK17, CFAP54, EEF1A1P33, ELK3, LINC02452, LTA4H, NEDD
0.0025059	0.081212917	ASCL1, DRAM1, HELLPAR, HSPE1P4, IGF1, LINC00485, LINC0
0.047166	0.318841722	C12orf42, C12orf73, CHST11, EID3, GLT8D2, HCFC2, HSP90B
0.034942	0.277895531	
0.021122	0.229363256	ELOCP32, FBXO21, KSR2, NOS1, RFC5, TESC, TESC-AS1, VSIG
0.048902	0.324862698	CCDC60, CIT, HSPB8, LINC02423, LINC02439, LINC02440, LIN
0.032898	0.271604667	ABCB9, ARL6IP4, ATP6V0A2, B3GNT4, BCL7A, C12orf65, CCD
0.038353	0.288988871	AACS, BRI3BP, DHX37, LINC00939, LINC02347, LINC02350, L
0.011334	0.172971135	GLT1D1, LINC00507, LINC00508, LINC02368, LINC02369, LIN
0.00053046	0.037441635	ANKRD26P3, CASC4P1, CENPIP1, CRYL1, CYCSP32, ESRRAP1,
0.028656	0.271604667	ANKRD20A19P, C1QTNF9, C1QTNF9-AS1, C1QTNF9B, CYCSP
0.032402	0.271604667	GAMTP2, LINC00457, LINC02343, NBEA, RFC3, RNU5A-4P, V
0.0062551	0.1281874	CAB39L, CDADC1, COX7CP1, CYSLTR2, FNDC3A, ITM2B, LINC
0.034007	0.274323133	LINC00458, LINC00558, MIR1297, RPL13AP25, ZNF646P1
0.001245	0.052461567	DIAPH3, DIAPH3-AS1, DIAPH3-AS2, EIF4A1P6, LINC00378, LI
0.008645	0.153912	LINC00358, LINC00376, LINC00395, LINC00448, LINC00459,
0.00058769	0.039821874	DACH1, LINC00348, MTCL1P1, RABEPKP1
0.033761	0.273641789	ATP6V1G1P7, BIVM, BIVM-ERCC5, CCDC168, ERCC5, FGF14,
0.018913	0.216477176	ARHGEF7, LINC00354, LINC00404, LINC01070, LINC02337, S
0.008904	0.153912	BAZ1A, BRMS1L, DNAJC8P1, DPRXP3, FAM177A1, IGBP1P1,
0.016747	0.209657412	CTAGE5, FBXO33, GEMIN2, KRT8P1, LINC00639, PNN, PPIAP
0.010973	0.172866426	FKBP1BP1, LRFN5
0.027754	0.270202736	ATP5C1P1, BMP4, LINC02331, MIR5580, RPS3AP46
0.044591	0.310852486	C14orf39, CCDC175, DHRS7, GNRHR2P1, GPR135, JKAMP, L3
0.00083759	0.045770241	EIF1AXP2, FUT8, FUT8-AS1, LINC02290, LINC02324, MIR470
0.010087	0.164301712	ACTN1, ACTN1-AS1, ADAM20, ADAM20P1, ADAM21, ADAM
0.032169	0.271604667	LINC02305, MTCYBP27, MTND4P33, MTND5P35, RNU6ATAC
0.0093589	0.159521655	BCL11B, BEGAIN, CCDC85C, CCNK, CYP46A1, DEGS2, DLK1, E
3.11E-05	0.007532976	AMN, ANKRD9, CDC42BPB, CINP, DIO3, DIO3OS, DYNC1H1,
0.030914	0.271604667	ADAM6, ATP5G1P1, BRF1, BTBD6, CDCA4, CLBA1, CRIP1, CR
0.011803	0.174496479	ATP10A, GABRA5, GABRB3, GABRG3, GABRG3-AS1, LINC009
0.023384	0.245734568	ARHGAP11A, AVEN, CHRM5, FMN1, GOLGA8N, GOLGA8O, G
0.01651	0.20871597	ANKRD63, BMF, BMF-AS1, BUB1B, BUB1B-PAK6, C15orf52,
0.0016948	0.0652498	LINC01491, MYEF2, RN7SKP101, RN7SKP139, RNU6-1014P,
0.0021315	0.076304113	ARPP19, BCL2L10, CERNA1, EEF1A1P22, EEF1B2P1, FAM214
0.00098555	0.047738751	ADAM10, ALDH1A2, BNIP2, CCNB2, FAM81A, GCNT3, GTF2A
0.030769	0.271604667	ANKDD1A, APH1B, CA12, CSNK1G1, DAPK2, FAM96A, FBXL2

0.0050837	0.113312997	BLM, CRTC3, CRTC3-AS1, FES, FURIN, HDDC3, HSPE1P3, IQG
0.034902	0.277895531	ABCC6, MIR3179-2, MIR3180-2, MIR3670-2, MIR6511A2, M
0.049705	0.328907305	ABCC6P1, MIR3179-3, MIR3179-4, MIR3180-3, MIR3670-3, I
0.01603	0.20871597	C16orf82, EEF1A1P38, HMGN2P3, HS3ST4, HSPE1P16, IL21R
0.032483	0.271604667	CDH8, RN7SKP76, RNU6-21P, RPS27AP16
0.036611	0.284490982	RPS15AP34, UBE2FP2
0.016248	0.20871597	CLEC18B, FA2H, GLG1, HCCAT5, HSPE1P7, LINC01568, MLKL
0.001183	0.051384667	RPS3P7, WWOX
0.0056723	0.122952638	LINC01228, LINC01229, MAF, MAFTRR, RNA5SP431, WWOX
0.033132	0.271604667	CDH13, RN7SL134P
0.00094741	0.047738751	ATP2C2, ATP2C2-AS1, COTL1, CRISPLD2, FAM92B, KIAA0513
0.017102	0.2113386	C16orf95, FBXO31, JPH3, LINC02181, MAP1LC3B, ZCCHC14
0.030726	0.271604667	ABR, C17orf97, DBIL5P, DOC2B, FAM57A, GEMIN4, GLOD4,
0.018488	0.21426219	ARRB2, ATP6V0CP1, C17orf107, C1QBP, CAMTA2, CHRNE, C
0.016832	0.209657412	AATF, ACACA, ARHGAP23, C17orf78, C17orf98, CISD3, CWC2
0.018186	0.213938083	AARSD1, ACLY, AOC2, AOC3, AOC4P, ATP5LP7, ATP6V0A1, B
0.010051	0.164301712	ACBD4, ADAM11, ARHGAP27, ARL4D, ASB16, ASB16-AS1, AT
0.018405	0.21426219	C17orf47, CCDC182, CUEDC1, DYNLL2, EPX, GDPD1, HSF5, LI
0.026889	0.264904174	APPBP2, BCAS3, C17orf64, C17orf82, CA4, CLTC, DHX40, DH
2.28E-05	0.006427318	BRIP1, EFCAB3, INTS2, MARCH10, MED13, METTL2A, MIR63
0.026041	0.262580083	ADCYAP1, BOLA2P1, CETN1, CLUL1, COLEC12, ENOSF1, IL9R
0.030348	0.271604667	AFG3L2, ANKRD20A5P, ANKRD62, C18orf15, CCDC58P3, CEF
0.020793	0.227247368	C18orf54, CCDC68, DCC, DYNAP, LINC01630, LINC01917, LIN
0.0068046	0.1314929	CBLN2, HNRNPA1P11, MIR548AV, NETO1, RNA5SP460
0.0046968	0.109448211	BDP1P, GALR1, LINC01029, RNA5SP461
0.0066072	0.1314929	ACTL9, ADAMTS10, ANGPTL4, BOLA3P2, ELOCP29, HNRNPM
0.0054429	0.1197438	ACP5, ASNA1, BEST2, CACNA1A, CALR, CCDC151, CCDC159,
0.029901	0.271604667	AP1M1, CIB3, CYP4F10P, CYP4F11, CYP4F12, CYP4F2, CYP4F
0.0035227	0.099457563	CCNE1, PPIAP58, RPL9P32, TAF9P3, URI1, ZNF536
0.0063564	0.1281874	ANKRD27, DPY19L3, LINC01533, LINC01782, LINC01791, LIN
0.031586	0.271604667	AKR1B1P7, CEBPA, CEBPA-AS1, CEBPG, CEP89, CHCHD2P3, C
0.0027063	0.08335404	CEACAM16, CEACAM19, CEACAM20, CEACAM22P, IGSF23, I
0.0020971	0.076304113	BAX, BBC3, BCAT2, BICRA, BICRA-AS1, BSPH1, C19orf73, C5A
0.016045	0.20871597	AURKC, DUXA, EDDM13, GALP, LINC01864, MIMT1, NLRP11
0.001037	0.047738751	C20orf96, CSNK2A1, DEFB125, DEFB126, DEFB127, DEFB128
0.001573	0.061968884	ADRA1D, AP5S1, CDS2, FTLP3, LINC00658, LINC01433, MAV
0.0024036	0.079837224	ACTR5, ADIG, ARHGAP40, ATG3P1, DHX35, FAM83D, LINC01
0.014708	0.197740889	LINC00317, LINC01425, LINC01687, NCAM2
0.03785	0.288988871	LINC00308, LINC01687, MAPK6PS2, MIR6130, MSANTD2P1,
6.93E-05	0.011747551	EEF1A1P1, LINC01684, LINC01689, TUBAP
0.037174	0.2862398	ATP5O, BTF3P6, C21orf62, C21orf62-AS1, CRYZL1, DNAJC28,
0.029217	0.271604667	CLDN14, DPRXP5, DSCR3, DSCR9, DYRK1A, HLCS, HLCS-IT1, K
0.025491	0.258573377	BACE2, BACE2-IT1, DSCAM, DSCAM-IT1, FAM3B, LINC00323
0.027187	0.26621259	ABCG1, C2CD2, CBS, CRYAA, ERVH48-1, FRGCA, LINC00111,
0.0095029	0.159521655	ABHD17AP4, ABHD17AP5, AIFM3, ARVCF, ASH2LP3, BCRP2,
0.00072437	0.042313199	ADORA2A, ADORA2A-AS1, ARL5AP4, BCRP1, BCRP3, C22orf1
4.15E-07	0.000234551	ADSL, ATF4, CACNA1I, ENTHD1, FAM83F, GRAP2, MGAT3, M

0.040518	0.292688746	ACO2, ATP5L2, C22orf46, CCDC134, CENPM, CHADL, COX6B
7.15E-05	0.015584873	ACOT7, CAMTA1, CAMTA1-DT, CHD5, DNAJC11, ESPN, GPR1
0.030092	0.335876382	AK4, COX6CP13, DNAJC6, INSL5, LEPR, LEPROT, MIER1, MIR
0.0057637	0.1517048	ACTBP12, BRDT, BTBD8, C1orf146, CCDC18, CCDC18-AS1, C
0.00026744	0.02824835	ADAMTSL4, ADAMTSL4-AS1, ANP32E, ANXA9, APH1A, ARNT
0.0032385	0.127103022	ADAM15, ARHGEF2, ASH1L, ASH1L-AS1, ASH1L-IT1, BGLAP,
1.83E-09	3.09E-06	ADAMTS4, APOA2, ARHGAP30, ATF6, ATP1A2, ATP1A4, B4G
0.019822	0.286880992	ABL2, ACBD6, AXDND1, CEP350, COX5BP8, EIF4A1P11, FAM
0.00095862	0.068767508	C1orf21, C1orf27, EDEM3, FAM129A, FTH1P25, HMCN1, IVN
0.037578	0.374971235	ERVMER61-1, FDPSP1, LINC01036, LINC01037, PLA2G4A, RN
0.013829	0.247344842	B3GALT2, CDC73, GLRX2, LINC01031, LINC01032, MIR1278,
0.0049158	0.140808508	ATP6V1G3, C1orf53, CRB1, DENND1B, EEF1A1P32, FAM204I
0.049729	0.42036215	ADAM17, ASAP2, C2orf48, CPSF3, CYS1, EIF1P7, GRHL1, HM
0.024838	0.315610677	APOB, CISD1P1, GDF7, HS1BP3, HS1BP3-IT1, LAPTM4A, LDA
0.015423	0.263281515	LINC01822, LINC01830, LINC01884, NUTF2P8, RN7SKP27, RI
0.014454	0.254450625	ABHD1, AGBL5, AGBL5-AS1, AGBL5-IT1, ATRAID, BABAM2, C
0.036191	0.366244251	CTBP2P5, ELOBP3, FOXN2, FSHR, GTF2A1L, LHCGR, MIR548E
0.00018662	0.0242606	LINC01122, LINC01793, RNA5SP94, RNU6-508P
0.038906	0.38227407	ACTR2, CEP68, KRT18P33, LINC01800, LINC02245, LINC0257
0.028415	0.331538912	AAK1, ADD2, ANTXR1, ANXA4, ASPRV1, B3GALNT1P1, BRD7
0.00065065	0.052361833	ACTG2, ALMS1, ALMS1-IT1, ALMS1P1, AUP1, BOLA3, BOLA3
0.0094487	0.199603788	LINC01851, LRRTM4
0.030712	0.337220844	FAM183DP, IL18R1, IL18RAP, IL1R1, IL1R2, IL1RL1, IL1RL2, LI
0.0093698	0.199603788	AMMECR1L, GPR17, IWS1, LIMS2, MAP3K2, MIR4783, MYO
0.027763	0.331144789	AHCYP4, MRPS18BP2, NXPH2, RN7SKP286, RN7SL283P, YY1
0.010582	0.218092439	BAZ2B, BTF3L4P2, DAPL1, GSTM3P2, MIR6888, OR7E28P, OI
0.049328	0.42036215	CSRNP3, GALNT3, MAPRE1P3, RN7SKP152, SCN1A, SCN2A, S
0.0094078	0.199603788	AGPS, API5P2, CYCTP, FKBP7, NFE2L2, OSBPL6, PDE11A, PJV
0.00022333	0.026959121	C2orf88, CAVIN2, DNAJB1P1, GLS, HIBCH, HMGB1P27, HNRN
0.020151	0.286880992	ALS2CR12, AOX1, AOX2P, AOX3P, BICD1P1, BZW1, C2CD6, C
0.025932	0.322243235	AGFG1, C2orf83, CCL20, COL4A3, COL4A4, DAW1, IRS1, MFF
0.02952	0.335876382	ARL4C, DNAJB3, HJURP, HSPE1P9, LINC01891, MROH2A, MS
0.001802	0.096027848	EFHB, HSPA8P18, KAT2B, KCNH8, MIR4791, PP2D1, RAB5A,
0.0054768	0.150576274	ACVR2B, ACVR2B-AS1, CCR8, CSRNP1, CX3CR1, DDTP1, DSTN
2.07E-05	0.011551488	C3orf14, FHIT, MIR548BB, PPIAP70, PPIAP71, PTPRG, PTPRG
0.017198	0.282180777	BBX, C3orf85, CCDC54, CD47, CIP2A, DPPA2, DPPA4, DUBR,
0.042239	0.398792793	ACTRT3, CLDN11, EGFEM1P, EIF5A2, GPR160, KLF7P1, KRT1
0.014875	0.259162371	CPLX1, CTBP1, CTBP1-AS, CTBP1-AS2, DGKQ, FGFRL1, GAK, I
0.019668	0.286880992	ADD1, ADRA2C, DOK7, GRK4, HGFAC, HTT, HTT-AS, LINC009
0.00036688	0.034445956	ALG1L3P, CLNK, DEFB108F, DEFB130D, DEFB131A, DRD5, EN
0.00010126	0.015584873	ANAPC4, ATP5LP3, CCDC149, DHX15, HNRNPA1P65, LGI2, LI
0.0081571	0.199603788	RPS3AP17
0.017967	0.286880992	LINC02497, LINC02501, MTCYBP43, PCDH7
0.016246	0.272391188	ELOCP33, FAM114A1, KLB, KLHL5, KRT18P25, LIAS, MIR5591
0.0010615	0.0717574	COX7B2, GABRA2, GABRA4, GABRB1, GABRG1, RAC1P2, RN
2.86E-05	0.011551488	ADAMTS3, AFM, AFP, ALB, ANKRD17, AREG, COX18, CXCL1,
0.036011	0.366244251	ANXA3, BMP2K, CCNG2, CNOT6L, CXCL13, FRAS1, HIGD1AP1

0.0013985	0.081498793	BMP3, COX5BP1, MTCYBP44, NPM1P41, PRKG2, RASGEF1B,
0.040248	0.390914483	AFF1, C4orf36, GAPDHP60, HSD17B11, HSD17B13, KLHL8, M
0.0016719	0.0941837	ATOH1, CCSER1, GRID2, HMGB3P15, KRT19P6, LNCPRESS2,
0.0073153	0.187316015	ADH7, C4orf17, DAPP1, DDIT4L, DNAJB14, DYNLL1P6, EMCN
0.028838	0.331538912	CXXC4, CXXC4-AS1, DDX3P3, LINC02428, LINC02503, RN7SL8
0.0089317	0.199603788	BBS12, CETN4P, FGF2, IL21-AS1, LINC01091, LINC02435, NU
0.042911	0.402807433	ANKRD50, LINC02516, TECRP2
0.034308	0.360127453	ELF2, FTH1P24, MGARP, NAA15, NDUFC1, NOCT, PPP1R14B
0.045436	0.404141263	CLGN, ELMOD2, H3F3AP6, MAML3, MGAT4D, MGST2, NDUI
0.012239	0.235044432	C4orf45, FABP5P12, FNIP2, LINC02233, LINC02477, MIR3688
0.019755	0.286880992	RNA5SP170, RNA5SP171, SPOCK3, TLL1
0.018959	0.286880992	AADAT, APOBEC3AP1, CLCN3, HPF1, HSP90AA6P, LINC01612
0.028728	0.331538912	
0.0038469	0.13088374	AGGF1P1, CLUHP4, DBET, DUX4, DUX4L1, DUX4L2, DUX4L3,
0.018174	0.286880992	CAPSL, IL7R, LMBRD2, MIR580, NADK2, NADK2-AS1, PRLR, R
0.023541	0.306163	C5orf42, C8orf59P2, EGFLAM, EGFLAM-AS1, EGFLAM-AS2, E
0.018751	0.286880992	C6, C7, CARD6, MROH2B, OXCT1, OXCT1-AS1, PLCXD3, PRKA
0.0090242	0.199603788	AK4P2, ANKRD55, C1GALT1P2, C5orf67, DDX4, HMGN1P17,
0.01013	0.211354321	CAB39P1, DEPDC1B, ELOVL7, ERCC8, GNL3LP1, KRT8P31, LIN
0.0013173	0.080262929	ACTBP2, AP3B1, ARSB, ATP6V1G1P6, BHMT, BHMT2, DMGD
0.038281	0.37833269	CHD1, CSNK1A1P3, CTBP2P4, DDX18P4, KRT8P32, LINC0134
0.017143	0.282180777	FER, GJA1P1, KRT18P42, LINC01023, LINC01848, MAN2A1, M
0.0038723	0.13088374	APC, CBX3P3, DCP2, EPB41L4A, EPB41L4A-AS1, EPB41L4A-A
0.0033187	0.127103022	RNU6-718P
0.0013161	0.080262929	ARGFXP1, CEP120, CSNK1G3, HMGB3P17, KRT18P16, KRT8P
0.0093679	0.199603788	ABLIM3, ADRB2, AFAP1L1, ARHGEF37, ARSI, CAMK2A, CARM
0.045328	0.404141263	ANXA6, ATOX1, CCDC69, CLMAT3, DCTN4, FAT2, G3BP1, GLI
0.020158	0.286880992	CNN3P1, F13A1, LY86, LY86-AS1, MIR5683, MIR7853, NRN1,
0.0089398	0.199603788	CAP2, DDX18P3, DEK, FAM8A1, KDM1B, KIF13A, MIR548A1,
0.041065	0.396570571	DHFRP5, EEF1B2P5, FKBP1C, KHDRBS2, LGSN, PTP4A1, RPL7
0.035336	0.361926303	FILIP1, IMPG1, LINC02540, MYO6, RN7SKP163, RNA5SP209,
0.027386	0.330588143	ATF1P1, COPS5P1, EPHA7, LINC02531, RPL5P19
0.0081904	0.199603788	COX6A1P3, GJA1, HMGB3P18, RNA5SP215, RNU2-8P, RNU4
0.049085	0.42036215	ADGB, EPM2A, FBXO30, FUNDC2P3, GRM1, RAB32, RNA5SP
0.00053503	0.045210035	CAHM, PACRG, PACRG-AS1, PACRG-AS2, PACRG-AS3, QKI, R
0.037719	0.374971235	C6orf118, PDE10A, RNA5SP226
0.046006	0.404948646	FAM120B, MIR4644, OR4F7P, PDCD2, PSMB1, RPL23AP47, T
0.0022921	0.104693216	ALG1L5P, C1GALT1, C7orf26, CCZ1B, COL28A1, FAM86LP, M
0.011561	0.23259631	SCIN, TAS2R2P, THSD7A, TMEM106B, VWDE
0.0043585	0.135302607	C7orf71, CBX3, CREB5, EIF4HP1, EVX1, EVX1-AS, HIBADH, HM
0.043743	0.402807433	AEBP1, BLVRA, CAMK2B, COA1, DBNL, DDX56, GCK, HECW1,
0.030941	0.33735671	CCNJP1, CCT6A, CHCHD2, CICP11, CICP12, CICP8, FKBP9P1, C
0.033548	0.35435075	AKAP9, ANKIB1, CDK14, CYP51A1, CYP51A1-AS1, ERVW-1, F
0.044182	0.402807433	DOCK4, DOCK4-AS1, EIF3IP1, IFRD1, IMMP2L, LRRN3, LSMEM
0.01912	0.286880992	C7orf77, EEF1GP1, GPR37, GRM8, POT1, POT1-AS1, RNU6-1
9.72E-05	0.015584873	ARF5, CALU, CICP14, FAM71F1, FAM71F2, FSCN3, GCC1, GR
0.00017796	0.0242606	AHCYL2, ATP6V1F, CCDC136, CEP41, CPA1, CPA2, CPA4, CPA

0.023551	0.306163	CHRM2, FAM180A, LUZP6, MTPN, NUP205, PSMC1P3, RNU6
0.0034901	0.128223239	DPP6, PAXIP1, PAXIP1-AS2
0.00010144	0.015584873	CSMD1
0.02635	0.325047445	AGPAT5, ANGPT2, DEFA1, DEFA10P, DEFA11P, DEFA1B, DEF
0.004143	0.135302607	ALG1L13P, CLDN23, DEFB103A, DEFB103B, DEFB104A, DEFB
0.037504	0.374971235	LINC00599, MIR124-1, MIR597, MSRA, TNKS
9.49E-05	0.015584873	ALG1L11P, ALG1L12P, BLK, C8orf49, CTSB, DEFB108D, DEFB
0.021775	0.299184959	CNOT7, FGF20, MICU3, MRPL49P2, MSR1, MTMR7, RN7SL4
0.026798	0.328178406	ATP6V1B2, LINC02153, LZTS1, LZTS1-AS1, RNA5SP257, RNU
0.044571	0.402807433	ATP6V1H, LYPLA1, MRPL15, RGS20, RNU105C, RNU6-1331P,
0.01369	0.247344842	CERNA3, CHCHD7, LINC00968, LYN, MOS, NPM1P21, PENK,
0.041969	0.398792793	C8orf89, FAM213AP2, HAUS1P3, KCNB2, RDH10, RDH10-AS
0.0056297	0.151018937	COL14A1, DEPTOR, DSCC1, MRPL13, MTBP, NCAPGP1, RN7S
0.027824	0.331144789	KHDRBS3, LINC01591, MAPRE1P1, MIR30B, MIR30D, RNU1-
0.008311	0.199603788	CLIC4P1, DMRTA1, ELAVL2, LINC01239, NOP56P2, SUMO2P2
0.0022245	0.104427917	IZUMO3, RMRPP5, RN7SKP120
0.042231	0.398792793	DNAJB5P1, GCNT1, LYPLA2P3, PCA3, PCSK5, PPIAP87, PRUN
0.0044834	0.135302607	NTRK2, SLC28A3, UBE2V1P10
0.041444	0.397956591	AAED1, C9orf3, CDC14B, EIF4BP3, ERCC6L2, FANCC, FBP1, FI
0.018958	0.286880992	HMGN2P32, KLF4, LINC01505, LINC01509, MIR8081, PPIAP8
0.0038248	0.13088374	DAB2IP, GGTA1P, GSN, HMGB1P37, LHX6, MIR4478, MORN5
0.047058	0.407836	AK8, BARHL1, CEL, CELP, CFAP77, DDX31, EEF1A1P5, GBGT1
0.044426	0.402807433	LINC00701, PFKP, PITRM1, PITRM1-AS1
0.033317	0.354124088	ABI1, APBB1IP, FAM238A, FAM238B, GAD2, GPN3P1, GPR15
0.015073	0.259932347	MIR548F1, NEFMP1, PCDH15, RNU6-687P
0.018426	0.286880992	ANXA2P3, CYP2C61P, DBF4P1, JMJD1C, JMJD1C-AS1, LINC01
0.044876	0.403406596	ACTR1A, ARL3, AS3MT, BORCS7, BORCS7-ASMT, BTRC, C10c
0.022667	0.305205952	CALHM1, CALHM2, CALHM3, CFAP43, CFAP58, CFAP58-AS1,
0.0018203	0.096027848	ATRNL1, CCDC172, GFRA1, NTAN1P1, SNRPGP6
0.028785	0.331538912	BBOX1, BBOX1-AS1, BDNF, BDNF-AS, CBX3P1, CCDC34, HSP9
0.011703	0.232683176	AMBRA1, ARHGAP1, ATG13, C11orf49, C11orf94, CHRM4, C
0.045683	0.404210838	AHNAK, ASRGL1, ATL3, B3GAT3, BSCL2, C11orf95, C11orf98,
0.0090757	0.199603788	AP5B1, ARL2, ARL2-SNX15, ATG2A, BAD, BATF2, C11orf84, C
0.020321	0.286880992	ACTN3, ACY3, AIP, ALDH3B2, ALG1L8P, ANKRD13D, B4GAT1
0.0055241	0.150576274	DDI1, LINC02552, MIR7641-1, PDGFD
0.0032025	0.127103022	ARHGAP20, FDX1, HNRNPA1P60, LINC02550, RDX, RNA5SP3
0.013388	0.247344842	IGSF9B, JAM3, MIR4697, MIR4697HG, NCAPD3, OPCML, OP
0.0091289	0.199603788	BICD1, DNM1L, FGD4, PKP2, RNU6-494P, YARS2
0.02803	0.331263636	AK6P1, ALG10, DUX4L27, RNA5SP357, RNU6-400P, RNU6-47
0.049747	0.42036215	ABCD2, C12orf40, CNTN1, KIF21A, LINC02471, LINC02555, L
0.047645	0.410816582	AAAS, AMHR2, ATF7, ATP5G2, C12orf10, CALCOCO1, CBX5,
0.023025	0.306163	AGAP2, AGAP2-AS1, ARHGEF25, ATP23, AVIL, B4GALNT1, CD
0.031821	0.340363861	CNOT2, FAHD2P1, KCNMB4, LINC01481, MYRFL, PTPRB, PTP
0.0058348	0.1517048	LINC02444, LINC02445, RNU6-1012P, TRHDE
0.0021063	0.1017042	CCDC59, LINC02426, METTL25, PPFIA2, RNU6-977P, RPL6P2
0.030729	0.337220844	AMER2, ANKRD20A10P, ATP12A, ATP8A2, CENPJ, ELOBP1, IL
0.030209	0.335876382	AKAP11, CALM2P3, CHCHD2P11, DGKH, DNAJC15, EPSTI1, F

0.0046343	0.137096879	CTAGE16P, DNAJA1P1, HMGN2P39, POLR3KP1, RNY4P29, RI
0.022755	0.305205952	BCRP9, HNRNPA3P5, LINC00364, LINC01052, MIR4704, MIR
0.027028	0.328613813	BORA, DACH1, DIS3, FABP5P1, H3F3BP1, KLF12, KLF5, LINC0
0.002688	0.11648	GYG1P2, RNU6-67P, SLITRK1, UBE2D3P4, VENTXP2
0.018231	0.286880992	RPL7P45
0.00052398	0.045210035	ARHGEF7, LINC00354, LINC00404, LINC01070, LINC02337, S
0.034877	0.361350854	ATP4B, CDC16, CHAMP1, CLCP2, GAS6, GAS6-AS1, GAS6-AS2
0.0074634	0.18825591	ABHD4, AJUBA, ARL6IP1P1, C14orf93, DAD1, HAUS4, LINC02
0.0044794	0.135302607	LINC02315, LRFN5
0.013018	0.24719573	FKBP1BP1, LRFN5
0.044511	0.402807433	AKAP5, CHURC1, CHURC1-FNTB, ESR2, FNTB, GPX2, HSPA2,
0.030056	0.335876382	EIF1AXP2, FUT8, FUT8-AS1, LINC02290, LINC02324, MIR470
0.00076908	0.059079327	ACTN1, ACTN1-AS1, ADAM20, ADAM20P1, ADAM21, ADAM
0.031262	0.338671667	ANGEL1, CIPC, CYCSP1, ESRRB, IRF2BPL, LINC01629, LINC02
0.046996	0.407836	FLRT2, LINC00911, LINC02329, RNU6-976P
0.00097658	0.068767508	ASB2, BTBD7, CCDC197, COX8C, DDX24, FAM181A, FAM181
0.02327	0.306163	BCL11B, BEGAIN, CCDC85C, CCNK, CYP46A1, DEGS2, DLK1, E
0.024542	0.315610677	ARHGAP11A, AVEN, CHRM5, FMN1, GOLGA8N, GOLGA8O, G
0.0033358	0.127103022	ANKRD63, BMF, BMF-AS1, BUB1B, BUB1B-PAK6, C15orf52, (
0.031668	0.340363861	ACTBP7, ADAL, ATP5HP1, CATSPER2, CATSPER2P1, CCNDBP1
0.024721	0.315610677	UNC13C
3.42E-05	0.011551488	ANP32BP1, ARID3B, C15orf39, C15orf59, C15orf59-AS1, CCD
0.0051626	0.145413233	BLM, CRTC3, CRTC3-AS1, FES, FURIN, HDDC3, HSPE1P3, IQG
0.013383	0.247344842	ASB9P1, C15orf32, CHD2, DUXAP6, ENO1P2, FAM174B, HM(
0.02054	0.286880992	LINC00924, LINC01197, NR2F2-AS1, RNU2-3P
0.020457	0.286880992	ARRDC4, FAM149B1P1, LINC00923, LINC02157, LINC02251,
0.0043001	0.135302607	CPPED1, MIR4718, SHISA9
0.011364	0.23138747	ERCC4, LINC02130, LINC02185, LINC02186, MIR193B, MIR19
0.022406	0.305205952	CHP2, COG7, DCTN5, EARS2, ERN2, GGA2, HS3ST2, NDUFAB
0.030206	0.335876382	ADGRG1, ADGRG5, AMFR, ARL2BP, BBS2, CCDC102A, CCL17
0.0043979	0.135302607	AARS, CHTF8, CLEC18A, CLEC18C, COG4, COG8, CYB5B, DDX
0.043398	0.402807433	CDH13, RN7SL134P
0.016279	0.272391188	ACSF3, AFG3L1P, ANKRD11, CDH15, CDK10, CENPBD1, CHM
0.0018751	0.096027848	CDRT15, CDRT15P1, COX10, COX10-AS1, HS3ST3B1, LINC02(
9.46E-05	0.015584873	ASIC2, CCL1, CCL11, CCL13, CCL2, CCL7, CCL8, LINC01989, RI
0.0035798	0.128720468	BTBD17, C17orf80, CDC42EP4, COG1, CPSF4L, DNAI2, FAM1
0.025842	0.322243235	ARHGAP28, L3MBTL4, L3MBTL4-AS1, LAMA1, LINC00668, LI
0.035066	0.361350854	AKR1B1P6, ANKRD12, APCDD1, CCDC58P1, GACAT2, KRT18I
0.046847	0.407836	ALPK2, ATP8B1, HMGN1P30, LINC01897, LINC01926, MALT1
0.0013298	0.080262929	AP1M1, CIB3, CYP4F10P, CYP4F11, CYP4F12, CYP4F2, CYP4F
0.025738	0.322243235	ARMC6, ATP13A1, BNIP3P10, BNIP3P9, BORCS8, BORCS8-M
0.0026552	0.11648	C19orf12, LINC00906, LINC01532, MAN1A2P1, PLEKHF1, PO
0.013904	0.247344842	CEACAM16, CEACAM19, CEACAM20, CEACAM22P, IGSF23, I
0.039158	0.382526127	AP2S1, ARHGAP35, CALM3, CCDC8, DACT3, DACT3-AS1, FKR
0.00024703	0.027832047	ANKEF1, C20orf187, FAT1P1, HIGD1AP15, JAG1, LINC01752,
0.044133	0.402807433	DYNLT3P1, KIF16B, MACROD2, OTOR, PCSK2, PPIAP17, RNU
0.00032101	0.031912171	ADA, EIF4EBP2P1, FITM2, GDAP1L1, GTSF1L, HNF4A, HNF4A

0.011917	0.233725057	ANKRD60, BMP7, BMP7-AS1, C20orf85, CASS4, CTCFL, FAM
0.0088069	0.199603788	ADRM1, ARF4P2, C20orf166-AS1, CABLES2, COL9A3, DIDO1,
0.02088	0.289239344	BTF3L4P1, BTG3, BTG3-AS1, C21orf91, C21orf91-OT1, CHOD
0.019745	0.286880992	C1QBPP1, FDPSP6, KRT18P2, LINC00320, LINC01683, LINC02
0.0033844	0.127103022	AATBC, AGPAT3, AIRE, C21orf2, C21orf33, CSTB, DNMT3L, H
0.0047051	0.137096879	C21orf58, DIP2A, DIP2A-IT1, DSTNP1, LSS, MCM3AP, MCM3
0.002779	0.11741275	BCRP7, C22orf39, CA15P1, CA15P2, CDC45, CLDN5, CLTCL1,
3.39E-06	0.002864973	ABHD17AP4, ABHD17AP5, AIFM3, ARVCF, ASH2LP3, BCRP2,
0.0020611	0.1017042	LINC01422, LINC01638, LINC02554, MN1, RNU6-1066P
0.018076	0.286880992	ADSL, ATF4, CACNA1I, ENTHD1, FAM83F, GRAP2, MGAT3, M
0.012032	0.233725057	ANP32BP2, ARHGAP8, EFCAB6, HMGN2P9, KIAA1644, KRT18
0.034647	0.361350854	CELSR1, CERK, GRAMD4, LINC01644, TBC1D22A, TBC1D22A-
0.013641	0.247344842	FAM19A5, LINC00898, LINC01310, MIR3201, MIR4535
0.0010523	0.11639375	AHDC1, ATPIF1, CHMP1AP1, DNAJC8, EPB41, EYA3, FAM76A
0.027257	0.366808718	ADGRB2, BSDC1, CCDC28B, COL16A1, DCDC2B, EIF3I, FABP3
0.027643	0.366808718	AGBL4, BEND5, CYP46A4P, PPP1R8P1, RNU4-61P, RNU6-723
0.0096698	0.249156536	ACADM, ASB17, CRYZ, DLSTP1, ERICH3, ERICH3-AS1, FPGT-T
0.0034323	0.163636915	CTBS, DNASE2B, GNG5, LINC01555, LPAR3, PRKACB, RPF1, S
0.038708	0.387767124	ACTBP12, BRDT, BTBD8, C1orf146, CCDC18, CCDC18-AS1, CC
0.049685	0.409321599	ABCA4, ABCD3, ARHGAP29, BCAR3, CHCHD2P5, DNTTIP2, FN
0.010468	0.257336	DPYD, DPYD-AS1, DPYD-AS2, DPYD-IT1, EEF1A1P11, LINC017
0.03735	0.384504777	LINC01661, MIR7852, MTATP6P14, MTCO1P14, NBPF4, NBP
0.045592	0.400170813	CASQ2, CNOT7P2, ELOCP20, HNRNPA1P43, LINC01765, NGF
0.0017884	0.136124561	ALDH9A1, FAM78B, LMX1A, LRRC52, MGST3, MIR3658, MIR
0.048391	0.409321599	ANKRD45, BANF1P4, CACYBP, CENPL, DARS2, GAS5, GAS5-A
0.0067158	0.21452546	ERVMER61-1, FDPSP1, LINC01036, LINC01037, PLA2G4A, RN
0.0064925	0.211784533	CLPTM1LP1, GAPDHP75, LINC01035, LINC01701, RNA5SP73
0.00019343	0.040934624	EEF1A1P14, LINC01724, RNU6-983P
0.022167	0.360853183	ATP6V1G3, C1orf53, CRB1, DENND1B, EEF1A1P32, FAM204I
0.0020397	0.138128484	ASCL5, CACNA1S, CAMSAP2, CSRP1, DDX59, FAM58BP, GPR
0.034619	0.378128819	AURKAPS1, BPNT1, C1orf115, DUSP10, EPRS, HDAC1P2, HLX
0.017348	0.310620947	ACTBP11, AIDA, AKR1B1P1, BROX, CAPN2, CAPN8, CCDC185
0.011905	0.275592946	ACBD3, ACBD3-AS1, CDKN2AIPNLP1, DNAH14, ENAH, EPHX1
0.043519	0.399557005	CMPK2, LINC00298, LINC00299, LINC01871, NRIR, RN7SKP1
0.012822	0.285626921	CAMKMT, EPAS1, LINC01121, LINC01820, LINC01833, PREPL
0.0092029	0.247309678	CRYGGP, KNOP1P3, LINC01867, NRXN1, ZNF863P
0.044345	0.399557005	BTF3P5, CCDC85A, CCDC88A, CFAP36, CLHC1, EFEMP1, EML
0.0023453	0.14635985	ACTG1P22, EIF3FP3, FANCL, LINC01795, VRK2
0.025411	0.366808718	AAK1, ADD2, ANTXR1, ANXA4, ASPRV1, B3GALNT1P1, BRD7
0.041199	0.399557005	ADD2, ANKRD53, ATP6V1B1, ATP6V1B1-AS1, CD207, CLEC4F
0.00075742	0.098639389	ACOXL, ACOXL-AS1, ACTR3, ANAPC1, BCL2L11, BUB1, CBWD
0.0038662	0.163636915	LINC01412, LINC01966, RNU7-2P, RPL17P12, RPL6P5, TEX41
0.0050929	0.199034233	ALS2CR12, AOX1, AOX2P, AOX3P, BICD1P1, BZW1, C2CD6, C
0.049823	0.409321599	ERBB4, IKZF2, LINC01878, LINC01953, MIR4438, MIR4776-1,
0.0097352	0.249156536	AGXT, ANKMY1, ANO7, AQP12A, AQP12B, BOK, BOK-AS1, C2
0.00038723	0.059598217	ATG4B, BOK, CICP10, D2HGDH, DTYMK, GAL3ST2, ING5, LIN
0.0016268	0.131151067	ACTG1P12, ATG7, CAND2, CHCHD4P4, CRIP1P1, CYCSP12, FA

0.016837	0.310620947	LINC01985, MTND4LP9, RBMS3, RBMS3-AS1, RBMS3-AS2, R
0.0070493	0.216990271	CMTM8, CNN2P6, GADL1, GPD1L, KRT18P15, MIR466, NIFKI
0.033509	0.37353334	ACVR2B, ACVR2B-AS1, CCR8, CSRNP1, CX3CR1, DDTP1, DSTI
0.0072247	0.218418163	ABHD5, ACKR2, ANO10, CCDC13, CCDC13-AS1, CDCP1, CLEC
0.029157	0.366808718	CACNA2D3, CACNA2D3-AS1, ESRG, LINC02017, LINC02030,
0.0013392	0.11639375	ABHD6, ACOX2, C3orf67, C3orf67-AS1, DNASE1L3, FAM107A
0.010893	0.263454986	FRMD4B, MDFIC2, MITF, RBM43P1, RN7SL418P, SAMMSON
0.030766	0.366808718	AGGF1P3, ALG1L6P, CLUHP10, CNTN3, DUX4L26, ENPP7P2,
0.045474	0.400170813	BBX, C3orf85, CCDC54, CD47, CIP2A, DPPA2, DPPA4, DUBR,
0.035176	0.381749795	BZW1P2, GAP43, LINC00903, LSAMP, LSAMP-AS1, RN7SL582
0.042638	0.399557005	CLSTN2, CLSTN2-AS1, PXYLP1, RPL23AP41, SLC25A36, SPSB4
0.036804	0.384504777	C3orf58, GAPDHP47, PBX2P1, RNA5SP144, SLC9A9, SLC9A9-
0.016894	0.310620947	ACTG1P23, EI24P1, MIR4789, NAALADL2, NAALADL2-AS1, N
0.047977	0.409321599	ACTL6A, CCDC39, CCDC39-AS1, DNAJC19, FAUP2, FLYWCH1
0.031528	0.367091103	ACAP2, ACAP2-IT1, APOD, KIF3AP1, LINC00969, LINC01983,
0.003801	0.163636915	ADD1, ADRA2C, DOK7, GRK4, HGFAC, HTT, HTT-AS, LINC009
0.013305	0.292064205	RPS3AP17
0.007809	0.227942017	AASDH, ARL9, CEP135, CLOCK, EXOC1, EXOC1L, KIAA1211, M
0.043276	0.399557005	GLDCP1, HOPX, IGFBP7, IGFBP7-AS1, LINC02380, LINC02494
2.19E-05	0.019114817	ART3, BTC, CCDC158, CCNI, CDKL2, CXCL10, CXCL11, CXCL9,
0.0044795	0.180566512	ACTR3BP4, BANK1, BDH2, CENPE, CISD2, EMCN, KRT8P46, L
0.003294	0.163636915	RNU6-224P
0.019488	0.333264485	LINC00498, LINC00499, LINC00500, LINC00616, LINC02172,
0.0088935	0.246831074	ELF2, FTH1P24, MGARP, NAA15, NDUFC1, NOCT, PPP1R14B
0.029666	0.366808718	APELA, CPE, FAM218A, FAM218BP, GK3P, HADHAP1, KLHL2,
0.03103	0.367091103	RNA5SP170, RNA5SP171, SPOCK3, TLL1
0.023935	0.366398455	LINC02112, LINC02199, LINC02226, MIR4458, MIR4458HG,
0.029833	0.366808718	ANKRD33B, ANKRD33B-AS1, CCT5, CMBL, CTNND2, DAP, FA
0.032122	0.367449635	BTG4P1, C5orf17, CDH10, LINC02211, LINC02228, LINC0223
0.042462	0.399557005	CAPSL, IL7R, LMBRD2, MIR580, NADK2, NADK2-AS1, PRLR, R
0.045619	0.400170813	C6, C7, CARD6, MROH2B, OXCT1, OXCT1-AS1, PLCXD3, PRKA
0.019024	0.329685837	ADAMTS6, CENPK, CWC27, FAM159B, MRPL49P1, NLN, PPW
0.00029874	0.056196313	LINC02115, LINC02163, NUDT12, PDZPH1P, RN7SL255P, RNU
0.0013011	0.11639375	LINC01950, PSMC1P5, RNA5SP189
0.01743	0.310620947	FER, GJA1P1, KRT18P42, LINC01023, LINC01848, MAN2A1, M
0.042421	0.399557005	AK3P4, ATG12, CCDC112, CCT5P1, CDO1, CTNNA1P1, FEM1C
0.021996	0.360853183	HMGB1P22, HMGB1P29, LINC01170, LINC02240, RN7SKP11
0.024485	0.366808718	ALDH7A1, BOLA3P3, C5orf63, GRAMD2B, HSPE1P10, LINC02
0.028273	0.366808718	C5orf46, DPYSL3, EEF1GP2, FBXO38, HMGN1P16, HTR4, JAK
0.0033569	0.163636915	CIR1P1, CNOT8, FAM114A2, FAXDC2, GALNT10, GEMIN5, GI
0.016695	0.310620947	ADAM19, APOOP1, C5orf52, CLINT1, CYFIP2, EBF1, FAM71B
0.029817	0.366808718	LINC01938, LINC02143, LSM1P2, RN7SKP60, RNU6-168P, RN
0.001375	0.11639375	EFCAB9, FBXW11, FGF18, KLF3P1, LINC01944, MIR3912, MII
0.030052	0.366808718	ADTRP, C6orf52, ELOVL2, ELOVL2-AS1, ERVFRD-1, GCM2, GC
0.0052551	0.199034233	CD83, GFOD1, GFOD1-AS1, LINC01108, MCUR1, MRPL35P1,
0.030649	0.366808718	CAP2, DDX18P3, DEK, FAM8A1, KDM1B, KIF13A, MIR548A1,
0.049082	0.409321599	FTH1P5, IL17A, LINCMD1, MIR133B, MIR206, PKHD1, RN7SL

0.04362	0.399557005	CLNS1AP1, ELOVL5, ERHP2, FAM83B, GCLC, GFRAL, HCRTR2
0.044852	0.399654926	BMP5, COL21A1, HMGCLL1, NPM1P36
0.037609	0.384504777	EYS, GCNT1P4, HNRNPDP2, PHF3, PTP4A1, RPL9P18
0.018587	0.32778949	ADH5P4, NUFIP1P, RNU7-66P, SLC25A51P1
0.0065049	0.211784533	DUTP5, HTR1E, KRT18P64, LINC02535, MTHFD2P2, NDUFA5
0.0020206	0.138128484	ATG5, BEND3, C6orf203, CD24, CRYBG1, LINC02526, LINC02
0.029021	0.366808718	FAM184A, MAN1A1, MIR548B, RNU6-194P
0.032493	0.369198987	EYA4, FTH1P26, HMGA1P7, HMGB1P13, HSPE1P21, LINC003
0.011259	0.266083167	ARFGEF3, CCDC28A, ECT2L, GVQW2, HEBP2, LINC02528, LIN
0.036511	0.384504777	ESR1, FBXO5, HSPD1P16, MTRF1L, MYCT1, NANOGP11, RGS
0.02887	0.366808718	AP5Z1, FOXK1, MIR4656, MMD2, PAPOLB, RADIL, RBAK, RBA
0.0024147	0.14635985	HSPA8P8, NDUFA4, NPM1P11, PHF14, RPL23AP52
0.0013562	0.11639375	ANLN, AOAH, AOAH-IT1, EEPD1, ELMO1, ELMO1-AS1, KIAA0
0.03762	0.384504777	CICP22, LINC00265, POU6F2, POU6F2-AS1, POU6F2-AS2, RA
0.00053318	0.075222812	C7orf25, GLI3, HECW1, HECW1-IT1, HMGN2P30, LINC01448
0.047534	0.409321599	HAUS6P1, HAUS6P3, HPVC1, LINC01446, RAC1P9, RN7SKP21
0.022951	0.364042028	CALM1P2, CDC42P2, EGFR, EGFR-AS1, ELDR, FKBP9P1, LANC
0.0097833	0.249156536	ARF1P1, ASB4, ATP5F1P2, BET1, CASD1, COL1A2, DYNC1I1,
0.029214	0.366808718	ACHE, ACTL6B, AGFG2, AP1S1, C7orf61, EPHB4, EPO, FBXO2
0.008498	0.240231057	DPP6, PAXIP1, PAXIP1-AS2
0.0070043	0.216990271	RN7SKP159, RPL23AP54
0.024239	0.366398455	LINC00599, MIR124-1, MIR597, MSRA, TNKS
0.035942	0.384504777	BNIP3L, CDCA2, DPYSL2, EBF2, PNMA2, PPP2R2A, RNA5SP25
0.02142	0.360853183	BUD31P1, DUSP26, FUT10, LINC01288, MAK16, MTND1P6, M
0.0057285	0.202048969	ADGRA2, ADRB3, ASH2L, BAG4, BRF2, C8orf86, DDHD2, EIF4
0.0036304	0.163636915	ARFGEF1, C8orf34, C8orf34-AS1, C8orf44, C8orf44-SGK3, C8
0.030686	0.366808718	HNRNPA1P4
0.01602	0.310453875	C8orf87, C8orf88, IRF5P1, LINC00535, LRRC69, MIR4661, MI
0.022018	0.360853183	CCNE2, CDH17, DPY19L4, ESRP1, FAM92A, FSBP, GEM, INTS
0.014744	0.293924718	NUDCD1, TMEM74, TRHR, TRMT10BP1
0.038311	0.386074542	EEF1A1P37, LINC01608, LINC01609, LINC02237, MTCO1P47
0.0077249	0.227942017	CSMD3, MIR2053, RNU4-37P, RPL30P16
0.037701	0.384504777	DMAC1, KDM4C, PPIAP33, PTPRD, RPL4P5
0.038291	0.386074542	KCTD10P1, LINGO2
0.048822	0.409321599	DNAJB5P1, GCNT1, LYPLA2P3, PCA3, PCSK5, PPIAP87, PRUN
0.035709	0.384504777	ATP5J2P3, CEP78, FOXB2, GNA14, GNA14-AS1, GNAQ, MTN
0.010488	0.257336	ASTN2, RN7SKP125, RN7SKP128, RNU6-1082P, RPL10P3, RP
0.047305	0.409321599	ADGRD2, ARPC5L, CRB2, DENND1A, GPR21, KRT18P67, LHX2
0.014757	0.293924718	ABL1, AIF1L, ASS1, EIF4A1P3, EXOSC2, FAM78A, FIBCD1, FU
0.024144	0.366398455	ABO, ADAMTS13, ADAMTSL2, ARF4P1, BRD3, BRD3OS, CACF
0.026995	0.366808718	ANAPC2, CYSRT1, DPH7, DPP7, ENTPD2, ENTPD8, EXD3, FAM
0.02847	0.366808718	ARRDC1, ARRDC1-AS1, CACNA1B, EHMT1, FAM157B, MIR60
0.046774	0.408187536	ATP5C1, CHCHD3P1, COX6CP17, GATA3, GATA3-AS1, ITIH2,
0.002783	0.16213861	CAMK1D, CDC123, CELF2, CELF2-AS1, CELF2-AS2, CUX2P1, D
0.037162	0.384504777	ARHGAP21, C10orf67, ENKUR, GPR158, GPR158-AS1, KIAA1
0.0032646	0.163636915	CKS1BP2, MIR604, MIR938, PTCHD3P1, RNU6-908P, SVIL, SV
0.0090504	0.24713431	CCND3P1, DNM1P17, EEF1A1P39, GOLGA2P6, JCAD, MAP3K

0.00036275	0.059598217	AK3P5, ARHGAP12, C1DP1, CCDC7, EPC1, HMGB1P7, ITGB1,
0.027703	0.366808718	MIR548F1, NEFMP1, PCDH15, RNU6-687P
0.023659	0.366398455	ADO, ALDH7A1P4, EGR2, JMJD1C, NRBF2, RNU6-543P, TATD
0.02798	0.366808718	ADD3, ADD3-AS1, BTF3P15, MAPKAPK5P1, MXI1, PHB2P1, R
0.040047	0.398821006	ABLIM1, ADRB1, AFAP1L2, ATRNL1, AURKAPS2, CASP7, CCD
0.0053085	0.199034233	ABCC8, AKR1B1P3, C11orf58, KCNJ11, MIR6073, NCR3LG1, N
0.0064107	0.211784533	BBOX1, BBOX1-AS1, BDNF, BDNF-AS, CBX3P1, CCDC34, HSP
0.041225	0.399557005	C11orf91, CCDC73, CD59, CSTF3, CSTF3-AS1, DEPDC7, EIF3M
0.016137	0.310453875	ABTB2, APIP, CAPRIN1, CAT, CD44, CD44-AS1, CIR1P3, EHF, I
5.60E-05	0.023701154	AP5B1, ARL2, ARL2-SNX15, ATG2A, BAD, BATF2, C11orf84, C
4.05E-05	0.022849292	ACTN3, ACY3, AIP, ALDH3B2, ALG1L8P, ANKRD13D, B4GAT1
0.044208	0.399557005	C11orf65, C11orf87, CYCSP29, DDX10, EXPH5, KDELC2, RNA
0.0032172	0.163636915	ANKK1, ATF4P4, CLDN25, DRD2, HTR3A, HTR3B, LRRC37A13
0.017227	0.310620947	BLID, BMPR1APS2, MIR100, MIR100HG, MIR125B1, MIRLET
0.0098603	0.249156536	DCPS, GSEC, KIRREL3, KIRREL3-AS1, KIRREL3-AS2, KIRREL3-A
0.032068	0.367449635	APLP2, ARHGAP32, BARX2, C11orf45, DDX18P5, ELOBP2, ET
0.0018493	0.136124561	ACAD8, B3GAT1, GLB1L2, GLB1L3, NCAPD3, THYN1, VPS26B
0.0055444	0.199716366	ADIPOR2, CACNA1C, CACNA1C-AS4, CACNA1C-IT1, CACNA1C
0.01451	0.293924718	ACRBP, ACSM4, ALG1L10P, APOBEC1, ATN1, C12orf57, C1R,
0.036309	0.384504777	AEBP2, CAPZA3, EEF1A1P4, LINC02398, LINC02468, MEF2BN
0.013456	0.292064205	BCAT1, C12orf77, CASC1, CENPUP2, ETFRF1, KNOP1P1, KRA
0.011316	0.266083167	AK4P3, AMN1, BICD1, CAPRIN2, DDX11, DDX11-AS1, DENND
0.023223	0.364042028	BICD1, DNM1L, FGD4, PKP2, RNU6-494P, YARS2
0.049364	0.409321599	ACVR1B, ACVRL1, ANKRD33, ARL2BPP2, ATG101, BTBD10P1
0.0011146	0.11639375	AGAP2, AGAP2-AS1, ARHGEF25, ATP23, AVIL, B4GALNT1, CD
0.030328	0.366808718	AVPR1A, DPY19L2, DUX4L52, FAM19A2, GAPDHP44, HNRNP
0.015741	0.309878058	CAND1, DYRK2, GGTA2P, LINC02408, LINC02420, LINC02421
0.00015028	0.037998176	ATXN7L3B, BBS10, CAPS2, CCNG2P1, GLIPR1, GLIPR1L1, GLI
0.0035586	0.163636915	ACACB, ALKBH2, ANKRD13A, ATP2A2, C12orf76, FAM222A,
0.027772	0.366808718	ANKRD26P2, AZU1P1, CDKN2AIPNLP3, COG6, CYCSP34, ELF1
0.040796	0.399557005	AKAP11, CALM2P3, CHCHD2P11, DGKH, DNAJC15, EPSTI1, F
0.030353	0.366808718	ARL11, C13orf42, CAB39L, CTAGE10P, DLEU1, DLEU1-AS1, D
0.043801	0.399557005	BCRP9, HNRNPA3P5, LINC00364, LINC01052, MIR4704, MIR
0.031516	0.367091103	ATXN8OS, ELL2P3, HNRNPA1P18, KLHL1, LINC00383, LINC0C
0.048489	0.409321599	BORA, DACH1, DIS3, FABP5P1, H3F3BP1, KLF12, KLF5, LINC0
0.04475	0.399654926	DDX6P2, LIN28AP2, LINC00397, LINC00430, LINC00433, MIR
0.012648	0.28550752	ASNSP3, CCR12P, CFL1P8, CLYBL, CLYBL-AS1, CLYBL-AS2, DO
0.027228	0.366808718	ADPRHL1, ATP11A, ATP11A-AS1, ATP11AUN, CUL4A, DCUN1
0.021775	0.360853183	BNIP3P1, CYB5AP5, LINC00645, LINC02293, LINC02294, LINC
0.049755	0.409321599	LINC00871, RPL10L
0.044187	0.399557005	LINC00648, MDGA2, MIR548Y, RNU6-297P, RPA2P1, RPL13A
0.042232	0.399557005	EIF1AXP2, FUT8, FUT8-AS1, LINC02290, LINC02324, MIR470
0.041439	0.399557005	LINC01148, LINC02296, LINC02330
0.013837	0.292825513	C14orf177, RN7SL714P, RPL3P4
0.032886	0.37117332	CHRNA7, DNM1P31, DNM1P32, GOLGA8K, OTUD7A, RN7SL1
0.031657	0.367091103	ARHGAP11A, AVEN, CHRM5, FMN1, GOLGA8N, GOLGA8O, G
0.02833	0.366808718	ACTBP7, ADAL, ATP5HP1, CATSPER2, CATSPER2P1, CCNDBP1

0.00015711	0.037998176	ARPP19, BCL2L10, CERNA1, EEF1A1P22, EEF1B2P1, FAM214
0.024812	0.366808718	C15orf65, CCPG1, CD24P2, CNOT6LP1, DNAAF4, DNAAF4-CC
0.027156	0.366808718	ABHD2, ACAN, AEN, ANPEP, AP3S2, ARPIN, C15orf38-AP3S2
0.019084	0.329685837	ARRDC4, FAM149B1P1, LINC00923, LINC02157, LINC02251,
0.0085138	0.240231057	ABCC1, ABCC6, ABCC6P2, BFAR, C16orf45, FOPNL, MARF1, M
0.026967	0.366808718	APOBR, ATP2A1, ATP2A1-AS1, ATXN2L, CD19, CDC37P1, CD
0.023015	0.364042028	ABCD1P3, ABHD17AP7, ABHD17AP8, ABHD17AP9, ACTR3BP
0.017424	0.310620947	CDH8, RN7SKP76, RNU6-21P, RPS27AP16
0.0062851	0.211784533	ACAP1, ALOX12B, ALOX15B, ALOXE3, ATP1B2, AURKB, BORC
0.0054079	0.199034233	ARHGEF15, CCDC42, CFAP52, DHRS7C, GAS7, GLP2R, GSG1L
0.033757	0.37353334	AP2B1, C17orf102, C17orf50, CCL14, CCL15, CCL15-CCL14, C
0.0043142	0.178144893	AATF, ACACA, ARHGAP23, C17orf78, C17orf98, CISD3, CWC2
0.0024206	0.14635985	C17orf112, CA10, LINC01982, LINC02089, MTCO1P40
0.0013734	0.11639375	AKAP1, ANKFN1, C17orf67, COIL, DGKE, GARSP1, MIR3614,
0.044285	0.399557005	AANAT, CYCSP40, CYGB, JMJD6, LINC00868, LINC02080, ME
0.012046	0.275592946	LINC01415, LINC01416, LINC01539, LINC01905, MIR4529, RI
0.014131	0.293924718	ARMC6, ATP13A1, BNIP3P10, BNIP3P9, BORCS8, BORCS8-M
0.00015272	0.037998176	C19orf12, LINC00906, LINC01532, MAN1A2P1, PLEKHF1, PO
0.0037699	0.163636915	A1BG, A1BG-AS1, C19orf18, CENPBD1P1, CHMP2A, ERVK3-1
0.043016	0.399557005	BTBD3, LINC00687, PA2G4P2, PGAM3P, RN7SKP111, RPS11I
0.044369	0.399557005	GAPDHP2, ISM1, ISM1-AS1, LINC01722, LINC01723, SPTLC3,
0.014361	0.293924718	DYNLT3P1, KIF16B, MACROD2, OTOR, PCSK2, PPIAP17, RNU
0.013768	0.292825513	ACSS2, ACTL10, AHCY, ASIP, BPIFA1, BPIFA2, BPIFA3, BPIFA4
0.029299	0.366808718	BCAS1, LINC01524, MRPS33P4, PPIAP10, RN7SKP184, RNU7
2.26E-05	0.019114817	ANKRD60, BMP7, BMP7-AS1, C20orf85, CASS4, CTCFL, FAM2
0.029484	0.366808718	CCT8, EIF4A1P1, HSPD1P7, LINC00113, LINC00161, LINC003
0.034046	0.374284922	BACH1, BACH1-AS1, BACH1-IT1, BACH1-IT2, BACH1-IT3, CLD
0.022845	0.364042028	ATP5O, BTF3P6, C21orf62, C21orf62-AS1, CRYZL1, DNAJC28,
0.0028731	0.16213861	ABHD17AP4, ABHD17AP5, AIFM3, ARVCF, ASH2LP3, BCRP2,
0.033751	0.37353334	ADSL, ATF4, CACNA1I, ENTHD1, FAM83F, GRAP2, MGAT3, M

ł, TRIM42, ZBTB38

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G4, OR10G5P, OR10G6, OR10G7, OR10G8, OR10G9, OR10N1P, OR10S1, OR4D5, OR6M1, OR6M2P, OR6M3P, C

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L3, MBTD1, MIR8059, NME1, NME1-NME2, NME2, RPL5P33, RPL7P48, SPAG9, TOB1, TOB1-AS1, UTP18, WFIK
P, VSX1
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ULIN, TRIO

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, GRID2IP, KDELR2, OCM, PMS2, RAC1, RN7SL556P, RN7SL851P, RNU6-218P, RPSAP73, RSPH10B, SNORA80D,
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2, NDUFB2-AS1, PPP1R2P6, RAB19, RN7SL771P, RNA5SP247, RNA5SP248, RNU1-58P, RNU4-74P, RNU6-85P, S
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, CCL21, CCL27, CD72, CLTA, CREB3, DNAJB5, FAM166B, FAM205A, FAM205BP, FAM205C, FAM214B, FAM221

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FUT4, GPR83, IZUMO1R, KDM4D, KDM4E, KDM4F, MIR548L, MRE11, PIWIL4, SESN3, SRSF8, ST13P11

5, GPR19, LOH12CR2, LRP6, MANSC1, MIR1244-4, RNU6-318P, RNU6-545P, RPL21P136, RPL23AP66
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25, DDX52, DUSP14, EPOP, GPR179, HMGB1P24, HNF1B, LASP1, LHX1, MIR2909, MIR378J, MIR4726, MIR4727
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, TUSC3
, CCL21, CCL27, CD72, CLTA, CREB3, DNAJB5, FAM166B, FAM205A, FAM205BP, FAM205C, FAM214B, FAM22
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, FAM167B, FAM229A, GAPDHP20, HCRTR1, HDAC1, IQCC, KHDRBS1, KPNA6, LAPTM5, LCK, LINC01225, LINC0
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F5P, NTNG1, PRMT6, SLC25A24, SLC25A24P1, SLC25A24P2, VAV3, VAV3-AS1
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NN2P8, CYP4F32P, DRD5P1, GGT8P, IGKV1-22, IGKV1-27, IGKV1-32, IGKV1-33, IGKV1-35, IGKV1-37, IGKV1-39,

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, RPS28P1, SPTB, SYNE2, TEX21P, ZBTB1, ZBTB25

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CB2, PLCB2-AS1, RASGRP1, RNA5SP392, SRP14, SRP14-AS1, THBS1
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29P, ROPN1L, ROPN1L-AS1, RPL30P7

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22, RN7SL655P, RN7SL803P, SAP30L, SAP30L-AS1
260P, RNU6-390P, RNU6-556P, SGCD, SOX30, THG1L, TIMD4

TLX3, UBTD2
M14C, TMEM170B
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27P, RPL21P65, RPS24P12, RTN4IP1

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, SNORD14B, SOX6, USH1C

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59, ZNF367

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6-495P, RNU6-513P, RNU6ATAC22P, RPL4P6, RRP7A, RRP7BP, SEPT3, SERHL, SERHL2, SHISA8, SLC25A17,

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L7, UBTFL9, YPEL5P2

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, SUB1P1, TDH, USP17L2, USP17L7, ZNF705CP, ZNF705D

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, SMARCD1, SPATS2, TFCP2, TMBIM6, TMPRSS12, TROAP, TUBA1A, TUBA1B, TUBA1C

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6-617P, TUBA3D, YBX1P7, ZNF806

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39, TPK1, TRBC1, TRBC2, TRBD1, TRBJ1-1, TRBJ1-2, TRBJ1-3, TRBJ1-4, TRBJ1-5, TRBJ1-6, TRBJ2-1, TRBJ2-2,

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, TRBJ2-2P, TRBJ2-3, TRBJ2-4, TRBJ2-5, TRBJ2-6, TRBJ2-7, TRBV24-1, TRBV25-1, TRBV26, TRBV27, TRBV28

P13, PCMTD1P2, PPP1R1AP2, RARRES2P10, RARRES2P5, RARRES2P6, RARRES2P7, RARRES2P8, RARRES2

IU6-971P, RPL21P4, RPL7L1P5, RPS26P8, RUNDC3A, RUNDC3A-AS1, SHC1P2, SLC25A39, SLC4A1, SMCO4I

KP63, RN7SL280P, RN7SL812P, RNA5SP493, RNU6-225P, RNY1P9, RTN4R, SCARF2, SDF2L1, SERPIND1, SL
121L1P, PRAME, RAB36, RGL4, RN7SL263P, RSPH14, ZDHHC8P1, ZNF280A, ZNF280B

1, USP17L3, USP17L4, USP17L8, ZNF705B, ZNF705G

RD112, SNORD113-1, SNORD113-2, SNORD113-3, SNORD113-4, SNORD113-5, SNORD113-6, SNORD113-

V3-7, IGHV4-28, IGHV4-4, IGHV5-10-1, IGHV6-1, IGHV7-27, IGHV7-4-1, IGHVII-1-1, IGHVII-15-1, IGHVII-2
, SNORD115-47, SNORD115-48, SNORD115-5, SNORD115-6, SNORD115-7, SNORD115-8, SNORD115-9, T

IU6-971P, RPL21P4, RPL7L1P5, RPS26P8, RUNDC3A, RUNDC3A-AS1, SHC1P2, SLC25A39, SLC4A1, SMCO4

NF625, ZNF625-ZNF20, ZNF627, ZNF653, ZNF69, ZNF700, ZNF709, ZNF763, ZNF788, ZNF791, ZNF799, ZN

43, TPRX1, TPRX2P, TRPM4, TULP2, ZNF114, ZNF541, ZSWIM9

KP63, RN7SL280P, RN7SL812P, RNA5SP493, RNU6-225P, RNY1P9, RTN4R, SCARF2, SDF2L1, SERPIND1, SL

U6-884P, RNVU1-1, RNVU1-2, RNVU1-3, RNY4P25, RPRD2, RPS27AP6, RPS29P29, SCNM1, SELENBP1, SE

1, USP17L3, USP17L4, USP17L8, ZNF705B, ZNF705G

AC3D1, SCYL1, SF1, SIPA1, SLC22A11, SLC22A12, SLC22A20P, SLC25A45, SNRPGP19, SNX15, SNX32, SPDY
3X10, TMEM134, TMEM151A, TSGA10IP, UNC93B1, UNC93B5, YIF1A, ZDHHC24

-3, TRAV13-1, TRAV13-2, TRAV14DV4, TRAV15, TRAV16, TRAV17, TRAV18, TRAV19, TRAV2, TRAV20, TRA

RD112, SNORD113-1, SNORD113-2, SNORD113-3, SNORD113-4, SNORD113-5, SNORD113-6, SNORD113-

KP63, RN7SL280P, RN7SL812P, RNA5SP493, RNU6-225P, RNY1P9, RTN4R, SCARF2, SDF2L1, SERPIND1, SL

AC3D1, SCYL1, SF1, SIPA1, SLC22A11, SLC22A12, SLC22A20P, SLC25A45, SNRPGP19, SNX15, SNX32, SPDY
X10, TMEM134, TMEM151A, TSGA10IP, UNC93B1, UNC93B5, YIF1A, ZDHHC24

P13, PCMTD1P2, PPP1R1AP2, RARRES2P10, RARRES2P5, RARRES2P6, RARRES2P7, RARRES2P8, RARRES2

KP63, RN7SL280P, RN7SL812P, RNA5SP493, RNU6-225P, RNY1P9, RTN4R, SCARF2, SDF2L1, SERPIND1, SL

5, SLC2AXP1, SLC9B1P2, SNX18P14, TEKT4, ZNF2, ZNF514

ȝ, TRBV29-1, TRBV30, TRBVA, TRBVB, TRPV5, TRPV6, WBP1LP1, ZYX

P9, RBM22P12, RBM22P13, RNA5-8SP2, RNA5SP406, RNA5SP407, RNA5SP408, RNA5SP409, RNA5SP410

P1, SOST, SPATA32, SPPL2C, TMEM101, TMEM106A, TMUB2, UBTF

.C7A4, SLC9A3P2, SMPD4P1, SNAP29, SNORA77B, SOCS2P2, TANGO2, THAP7, THAP7-AS1, TMEM191A, T

·7, SNORD113-8, SNORD113-9, SNORD114-1, SNORD114-10, SNORD114-11, SNORD114-12, SNORD114-1

2-1, IGHVII-26-2, IGHVII-28-1, IGHVIII-11-1, IGHVIII-13-1, IGHVIII-16-1, IGHVIII-2-1, IGHVIII-22-2, IGHVIII-2
MEM261P1, TVP23BP1, UBE3A

P1, SOST, SPATA32, SPPL2C, TMEM101, TMEM106A, TMUB2, UBTF

IF823, ZNF833P, ZNF844, ZNF878, ZNF887P

.C7A4, SLC9A3P2, SMPD4P1, SNAP29, SNORA77B, SOCS2P2, TANGO2, THAP7, THAP7-AS1, TMEM191A, T

MA6C, SETDB1, SF3B4, SV2A, TARS2, TMOD4, TNFAIP8L2, UBE2D3P3, VPS45, VPS72, ZNF687

YC, SSSCA1, SSSCA1-AS1, STIP1, SYVN1, TIGD3, TM7SF2, TMEM262, TRMT112, TRPT1, VEGFB, VPS51, ZFF

\V21, TRAV22, TRAV23DV6, TRAV24, TRAV25, TRAV26-1, TRAV26-2, TRAV27, TRAV28, TRAV29DV5, TRA\

·7, SNORD113-8, SNORD113-9, SNORD114-1, SNORD114-10, SNORD114-11, SNORD114-12, SNORD114-1

.C7A4, SLC9A3P2, SMPD4P1, SNAP29, SNORA77B, SOCS2P2, TANGO2, THAP7, THAP7-AS1, TMEM191A, T

YC, SSSCA1, SSSCA1-AS1, STIP1, SYVN1, TIGD3, TM7SF2, TMEM262, TRMT112, TRPT1, VEGFB, VPS51, ZFF

P9, RBM22P12, RBM22P13, RNA5-8SP2, RNA5SP406, RNA5SP407, RNA5SP408, RNA5SP409, RNA5SP410

C7A4, SLC9A3P2, SMPD4P1, SNAP29, SNORA77B, SOCS2P2, TANGO2, THAP7, THAP7-AS1, TMEM191A, T

), RNA5SP411, RNA5SP412, RNA5SP413, RNA5SP414, RNA5SP415, RNA5SP416, RNA5SP417, RNA5SP418,

TMEM191C, TOP3B, TOP3BP1, TRMT2A, TUBA3FP, TUBA3GP, TXNRD2, UBE2L3, USP41, VPREB1, YDJC, YF

.3, SNORD114-14, SNORD114-15, SNORD114-16, SNORD114-17, SNORD114-18, SNORD114-19, SNORD1:

!5-1, IGHVIII-26-1, IGHVIII-5-1, IGHVIII-5-2, JAG2, LINC00226, LINC02298, MIR4507, M

TMEM191C, TOP3B, TOP3BP1, TRMT2A, TUBA3FP, TUBA3GP, TXNRD2, UBE2L3, USP41, VPREB1, YDJC, YF

ᵓL1, ZNHIT2

/3, TRAV30, TRAV31, TRAV32, TRAV33, TRAV34, TRAV35, TRAV36DV7, TRAV37, TRAV38-1, TRAV38-2DV8

.3, SNORD114-14, SNORD114-15, SNORD114-16, SNORD114-17, SNORD114-18, SNORD114-19, SNORD11

TMEM191C, TOP3B, TOP3BP1, TRMT2A, TUBA3FP, TUBA3GP, TXNRD2, UBE2L3, USP41, VPREB1, YDJC, YF

PL1, ZNHIT2

), RNA5SP411, RNA5SP412, RNA5SP413, RNA5SP414, RNA5SP415, RNA5SP416, RNA5SP417, RNA5SP418,

TMEM191C, TOP3B, TOP3BP1, TRMT2A, TUBA3FP, TUBA3GP, TXNRD2, UBE2L3, USP41, VPREB1, YDJC, YF

, RNA5SP419, RNA5SP420, RNA5SP421, RNA5SP422, RNA5SP423, SLC25A1P4,

PEL1, ZDHHC8, ZNF74

14-2, SNORD114-20, SNORD114-21, SNORD114-22, SNORD114-23,

ᵖEL1, ZDHHC8, ZNF74

3, TRAV39, TRAV4

14-2, SNORD114-20, SNORD114-21, SNORD114-22, SNORD114-23,

PEL1, ZDHHC8, ZNF74

, RNA5SP419, RNA5SP420, RNA5SP421, RNA5SP422, RNA5SP423, SLC25A1P4,

ᵖEL1, ZDHHC8, ZNF74

*Note: p-values < 0.05 (before and after correction) are highlighted in red.

Phenotype 1 Code	Phenotype 2 Code	Genetic Correlation Coefficient
14c_i_tb.sumstats	22_i_RA_okada.sumstats	0.1799
14c_i_tb.sumstats	28_i_t1d.sumstats	0.0362
14c_i_tb.sumstats	3_i_allergyany.sumstats	0.2212
14c_i_tb.sumstats	3_i_asthma.sumstats	0.0635
14c_i_tb.sumstats	3_i_atopicdermatitis.sumstats	0.0958
14c_i_tb.sumstats	3_i_childhoodear.sumstats	-0.114
14c_i_tb.sumstats	3_i_crp.sumstats	-0.0959
14c_i_tb.sumstats	3_i_hypothyroid.sumstats	0.1688
14c_i_tb.sumstats	3_i_pbc.sumstats	0.2587
14c_i_tb.sumstats	3_i_psoriasis.sumstats	-0.0042
14c_i_tb.sumstats	3_i_sle.sumstats	0.1447
14c_i_tb.sumstats	5_i_celiac.sumstats	0.1129
14c_i_tb.sumstats	6_i_crohns_liu_05.sumstats	0.2308
14c_i_tb.sumstats	7_i_uc_liu_05.sumstats	0.3414
22_i_RA_okada.sumstats	28_i_t1d.sumstats	0.4149
22_i_RA_okada.sumstats	3_i_allergyany.sumstats	0.0377
22_i_RA_okada.sumstats	3_i_asthma.sumstats	-0.0475
22_i_RA_okada.sumstats	3_i_atopicdermatitis.sumstats	-0.0552
22_i_RA_okada.sumstats	3_i_childhoodear.sumstats	0.0712
22_i_RA_okada.sumstats	3_i_crp.sumstats	-0.0341
22_i_RA_okada.sumstats	3_i_hypothyroid.sumstats	0.3355
22_i_RA_okada.sumstats	3_i_pbc.sumstats	0.27
22_i_RA_okada.sumstats	3_i_psoriasis.sumstats	0.1676
22_i_RA_okada.sumstats	3_i_sle.sumstats	0.4634
22_i_RA_okada.sumstats	5_i_celiac.sumstats	0.2381
22_i_RA_okada.sumstats	6_i_crohns_liu_05.sumstats	0.0873
22_i_RA_okada.sumstats	7_i_uc_liu_05.sumstats	0.1314
28_i_t1d.sumstats	3_i_allergyany.sumstats	0.0224
28_i_t1d.sumstats	3_i_asthma.sumstats	-0.0137
28_i_t1d.sumstats	3_i_atopicdermatitis.sumstats	-0.2101
28_i_t1d.sumstats	3_i_childhoodear.sumstats	0.0249
28_i_t1d.sumstats	3_i_crp.sumstats	-0.0344
28_i_t1d.sumstats	3_i_hypothyroid.sumstats	0.3952
28_i_t1d.sumstats	3_i_pbc.sumstats	0.11
28_i_t1d.sumstats	3_i_psoriasis.sumstats	0.1237
28_i_t1d.sumstats	3_i_sle.sumstats	0.2546
28_i_t1d.sumstats	5_i_celiac.sumstats	0.3214
28_i_t1d.sumstats	6_i_crohns_liu_05.sumstats	-0.0155
28_i_t1d.sumstats	7_i_uc_liu_05.sumstats	0.1891
3_i_allergyany.sumstats	3_i_asthma.sumstats	0.7855
3_i_allergyany.sumstats	3_i_atopicdermatitis.sumstats	0.2458

3_i_allergyany.sumstats	3_i_childhoodear.sumstats	0.2223
3_i_allergyany.sumstats	3_i_crp.sumstats	0.1271
3_i_allergyany.sumstats	3_i_hypothyroid.sumstats	0.2043
3_i_allergyany.sumstats	3_i_pbc.sumstats	0.0529
3_i_allergyany.sumstats	3_i_psoriasis.sumstats	-0.0055
3_i_allergyany.sumstats	3_i_sle.sumstats	-0.0096
3_i_allergyany.sumstats	5_i_celiac.sumstats	0.1928
3_i_allergyany.sumstats	6_i_crohns_liu_05.sumstats	0.0606
3_i_allergyany.sumstats	7_i_uc_liu_05.sumstats	0.0448
3_i_asthma.sumstats	3_i_atopicdermatitis.sumstats	0.389
3_i_asthma.sumstats	3_i_childhoodear.sumstats	0.1516
3_i_asthma.sumstats	3_i_crp.sumstats	0.1712
3_i_asthma.sumstats	3_i_hypothyroid.sumstats	0.0704
3_i_asthma.sumstats	3_i_pbc.sumstats	0.0387
3_i_asthma.sumstats	3_i_psoriasis.sumstats	-0.0506
3_i_asthma.sumstats	3_i_sle.sumstats	-0.0878
3_i_asthma.sumstats	5_i_celiac.sumstats	0.1509
3_i_asthma.sumstats	6_i_crohns_liu_05.sumstats	-0.0243
3_i_asthma.sumstats	7_i_uc_liu_05.sumstats	-0.027
3_i_atopicdermatitis.sumstats	3_i_childhoodear.sumstats	0.0228
3_i_atopicdermatitis.sumstats	3_i_crp.sumstats	0.2293
3_i_atopicdermatitis.sumstats	3_i_hypothyroid.sumstats	-0.165
3_i_atopicdermatitis.sumstats	3_i_pbc.sumstats	0.0489
3_i_atopicdermatitis.sumstats	3_i_psoriasis.sumstats	0.0498
3_i_atopicdermatitis.sumstats	3_i_sle.sumstats	-0.0176
3_i_atopicdermatitis.sumstats	5_i_celiac.sumstats	0.2192
3_i_atopicdermatitis.sumstats	6_i_crohns_liu_05.sumstats	0.1925
3_i_atopicdermatitis.sumstats	7_i_uc_liu_05.sumstats	0.0765
3_i_childhoodear.sumstats	3_i_crp.sumstats	0.0575
3_i_childhoodear.sumstats	3_i_hypothyroid.sumstats	0.1369
3_i_childhoodear.sumstats	3_i_pbc.sumstats	0.0199
3_i_childhoodear.sumstats	3_i_psoriasis.sumstats	0.0139
3_i_childhoodear.sumstats	3_i_sle.sumstats	-0.0026
3_i_childhoodear.sumstats	5_i_celiac.sumstats	0.1624
3_i_childhoodear.sumstats	6_i_crohns_liu_05.sumstats	0.0252
3_i_childhoodear.sumstats	7_i_uc_liu_05.sumstats	0.0023
3_i_crp.sumstats	3_i_hypothyroid.sumstats	0.0013
3_i_crp.sumstats	3_i_pbc.sumstats	0.1365
3_i_crp.sumstats	3_i_psoriasis.sumstats	0.2111
3_i_crp.sumstats	3_i_sle.sumstats	0.0549
3_i_crp.sumstats	5_i_celiac.sumstats	0.0086
3_i_crp.sumstats	6_i_crohns_liu_05.sumstats	0.1148
3_i_crp.sumstats	7_i_uc_liu_05.sumstats	-0.1161
3_i_hypothyroid.sumstats	3_i_pbc.sumstats	0.2377
3_i_hypothyroid.sumstats	3_i_psoriasis.sumstats	0.1317
3_i_hypothyroid.sumstats	3_i_sle.sumstats	0.1212
3_i_hypothyroid.sumstats	5_i_celiac.sumstats	0.3799

3_i_hypothyroid.sumstats	6_i_crohns_liu_05.sumstats	-0.0051
3_i_hypothyroid.sumstats	7_i_uc_liu_05.sumstats	0.0665
3_i_pbc.sumstats	3_i_psoriasis.sumstats	0.2745
3_i_pbc.sumstats	3_i_sle.sumstats	0.621
3_i_pbc.sumstats	5_i_celiac.sumstats	0.0268
3_i_pbc.sumstats	6_i_crohns_liu_05.sumstats	0.2419
3_i_pbc.sumstats	7_i_uc_liu_05.sumstats	0.3192
3_i_psoriasis.sumstats	3_i_sle.sumstats	0.1392
3_i_psoriasis.sumstats	5_i_celiac.sumstats	0.2318
3_i_psoriasis.sumstats	6_i_crohns_liu_05.sumstats	0.3432
3_i_psoriasis.sumstats	7_i_uc_liu_05.sumstats	0.3851
3_i_sle.sumstats	5_i_celiac.sumstats	0.2099
3_i_sle.sumstats	6_i_crohns_liu_05.sumstats	0.1162
3_i_sle.sumstats	7_i_uc_liu_05.sumstats	0.1395
5_i_celiac.sumstats	6_i_crohns_liu_05.sumstats	0.2663
5_i_celiac.sumstats	7_i_uc_liu_05.sumstats	0.2325
6_i_crohns_liu_05.sumstats	7_i_uc_liu_05.sumstats	0.7133

Estimated Error of Genetic Correlation Coefficient	Genetic Correlation Uncorrected *P*-Value*	Genetic Correlation *P*-Value After Benjamini-Hochberg Correction*	Genetic Correlation *P*-Value After Bonferroni Correction*	Genetic Covariance
0.1028	0.0801	0.17521875	1	0.0282
0.1333	0.7858	0.896836957	1	0.0064
0.0836	0.0081	0.030375	0.8505	0.0271
0.0858	0.4592	0.651567568	1	0.0073
0.1554	0.5375	0.714398734	1	0.0106
0.1108	0.3036	0.496730769	1	-0.0129
0.0925	0.3001	0.496730769	1	-0.0135
0.0956	0.0775	0.173138298	1	0.0168
0.133	0.0517	0.132402439	1	0.0621
0.1284	0.974	0.983365385	1	-0.0015
0.1418	0.3075	0.496730769	1	0.0293
0.1579	0.4746	0.66444	1	0.0259
0.0998	0.0207	0.065863636	1	0.0644
0.1391	0.0141	0.047758065	1	0.0675
0.1351	0.0021	0.0105	0.2205	0.0692
0.0483	0.4354	0.651567568	1	0.0042
0.0701	0.4979	0.687888158	1	-0.0049
0.0851	0.5166	0.704454545	1	-0.006
0.0502	0.1565	0.2934375	1	0.0073
0.0548	0.5336	0.714398734	1	-0.0047
0.0749	7.44E-06	8.68E-05	0.000781379	0.0301
0.0848	0.0014	0.007736842	0.147	0.0609
0.0683	0.0141	0.047758065	1	0.058
0.0629	1.76E-13	5.85E-12	1.85E-11	0.0897
0.0777	0.0022	0.0105	0.231	0.0493
0.0639	0.172	0.316842105	1	0.0234
0.0653	0.0442	0.119	1	0.0246
0.0736	0.761	0.887833333	1	0.0029
0.0772	0.859	0.939	1	-0.0017
0.1169	0.0724	0.16526087	1	-0.0252
0.0678	0.7131	0.860637931	1	0.0029
0.0849	0.6853	0.859412791	1	-0.0056
0.0969	4.56E-05	0.000399044	0.004788525	0.0402
0.1126	0.3287	0.515910448	1	0.0322
0.1014	0.2227	0.403163793	1	0.0474
0.1376	0.0643	0.157011628	1	0.0577
0.0938	6.00E-04	0.003705882	0.063	0.0831
0.0818	0.8501	0.939	1	-0.0048
0.0881	0.0317	0.097897059	1	0.039
0.0357	2.00E-107	2.10E-105	2.10E-105	0.0621
0.0669	2.00E-04	0.001615385	0.021	0.0202

0.0475	2.86E-06	3.76E-05	0.000300594	0.0173
0.0457	0.0054	0.02268	0.567	0.0133
0.0497	3.98E-05	0.000380071	0.004180785	0.014
0.0713	0.4578	0.651567568	1	0.0093
0.0546	0.9196	0.965480198	1	-0.0014
0.0615	0.8763	0.939	1	-0.0014
0.0712	0.0068	0.027461538	0.714	0.0311
0.0582	0.298	0.496730769	1	0.0123
0.0575	0.4352	0.651567568	1	0.0064
0.0741	1.50E-07	3.14E-06	1.57E-05	0.0297
0.0415	3.00E-04	0.00225	0.0315	0.0111
0.0497	6.00E-04	0.003705882	0.063	0.0167
0.0629	0.2631	0.468228814	1	0.0045
0.1018	0.7039	0.859412791	1	0.0063
0.0673	0.4515	0.651567568	1	-0.0123
0.0822	0.2857	0.491778689	1	-0.0118
0.0786	0.0548	0.137	1	0.0224
0.0617	0.6935	0.859412791	1	-0.0046
0.0779	0.7288	0.869590909	1	-0.0036
0.0749	0.7606	0.887833333	1	0.0017
0.108	0.0337	0.1011	1	0.0227
0.0966	0.0876	0.18396	1	-0.0108
0.1259	0.6976	0.859412791	1	0.0084
0.1157	0.6669	0.853957317	1	0.0123
0.1134	0.8764	0.939	1	-0.0025
0.1446	0.1294	0.256358491	1	0.0308
0.0912	0.0348	0.101310811	1	0.0379
0.1016	0.4514	0.651567568	1	0.0106
0.0526	0.2745	0.480375	1	0.0056
0.0492	0.0054	0.02268	0.567	0.0087
0.0701	0.7771	0.896653846	1	0.0032
0.0662	0.8336	0.931148936	1	0.0033
0.0699	0.9699	0.983365385	1	-3.00E-04
0.0773	0.0357	0.101310811	1	0.0241
0.0537	0.6394	0.828851852	1	0.0047
0.056	0.967	0.983365385	1	3.00E-04
0.069	0.9854	0.9854	1	1.00E-04
0.0921	0.1381	0.266318182	1	0.0297
0.087	0.0153	0.050203125	1	0.0665
0.1113	0.6216	0.81585	1	0.0098
0.0766	0.9106	0.965480198	1	0.0017
0.0628	0.0674	0.160840909	1	0.0286
0.0758	0.1256	0.253615385	1	-0.0202
0.089	0.0076	0.029555556	0.798	0.0333
0.0732	0.0719	0.16526087	1	0.0275
0.1242	0.3292	0.515910448	1	0.0139
0.0891	2.01E-05	0.000210861	0.00210861	0.0495

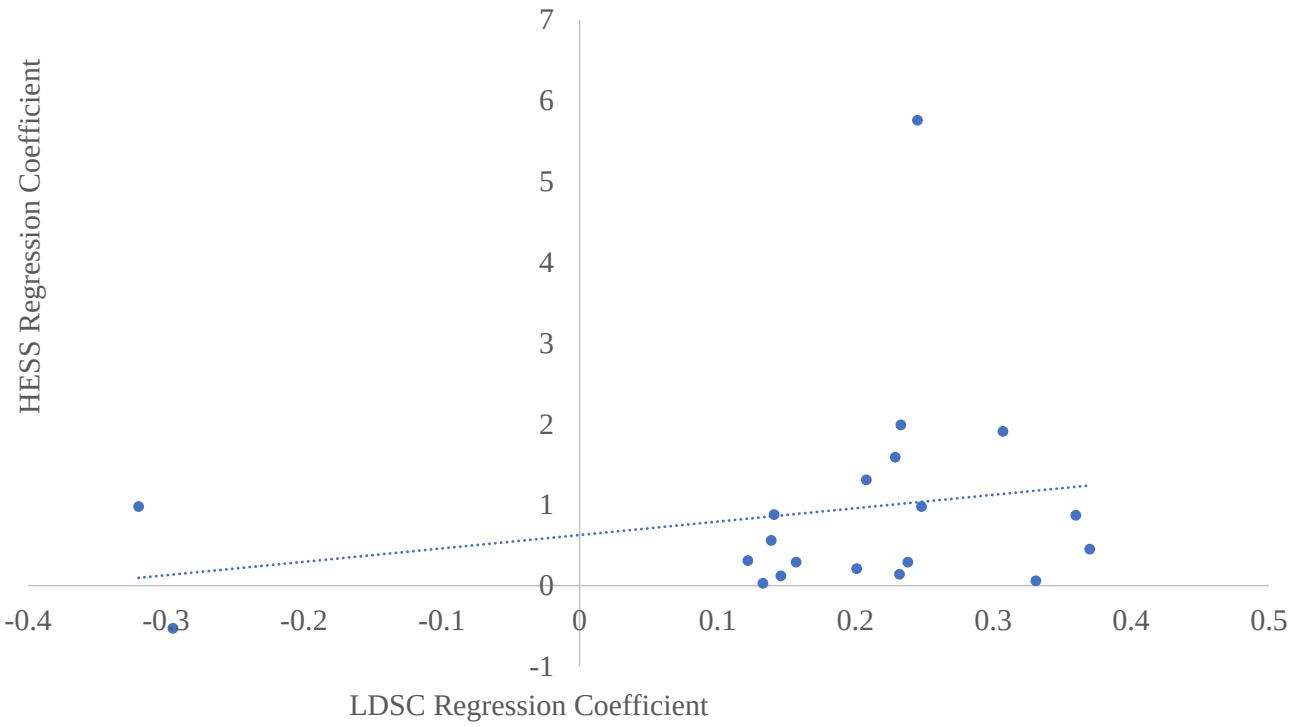
0.0569	0.9287	0.965480198	1	-8.00E-04
0.0713	0.3511	0.542139706	1	0.0076
0.0987	0.0054	0.02268	0.567	0.1443
0.0847	2.23E-13	5.85E-12	2.34E-11	0.1873
0.1225	0.8266	0.931148936	1	0.0078
0.0765	0.0016	0.0084	0.168	0.1023
0.0894	4.00E-04	0.0028	0.042	0.0923
0.087	0.1098	0.226058824	1	0.0626
0.091	0.0108	0.039103448	1	0.1136
0.0663	2.28E-07	3.99E-06	2.39E-05	0.2155
0.0803	1.62E-06	2.43E-05	0.000170447	0.1701
0.105	0.0455	0.1194375	1	0.0566
0.0676	0.0857	0.183642857	1	0.0403
0.0944	0.1395	0.266318182	1	0.0341
0.0798	8.00E-04	0.004666667	0.084	0.1015
0.1118	0.0375	0.103618421	1	0.0614
0.0568	3.51E-36	1.84E-34	3.69E-34	0.247

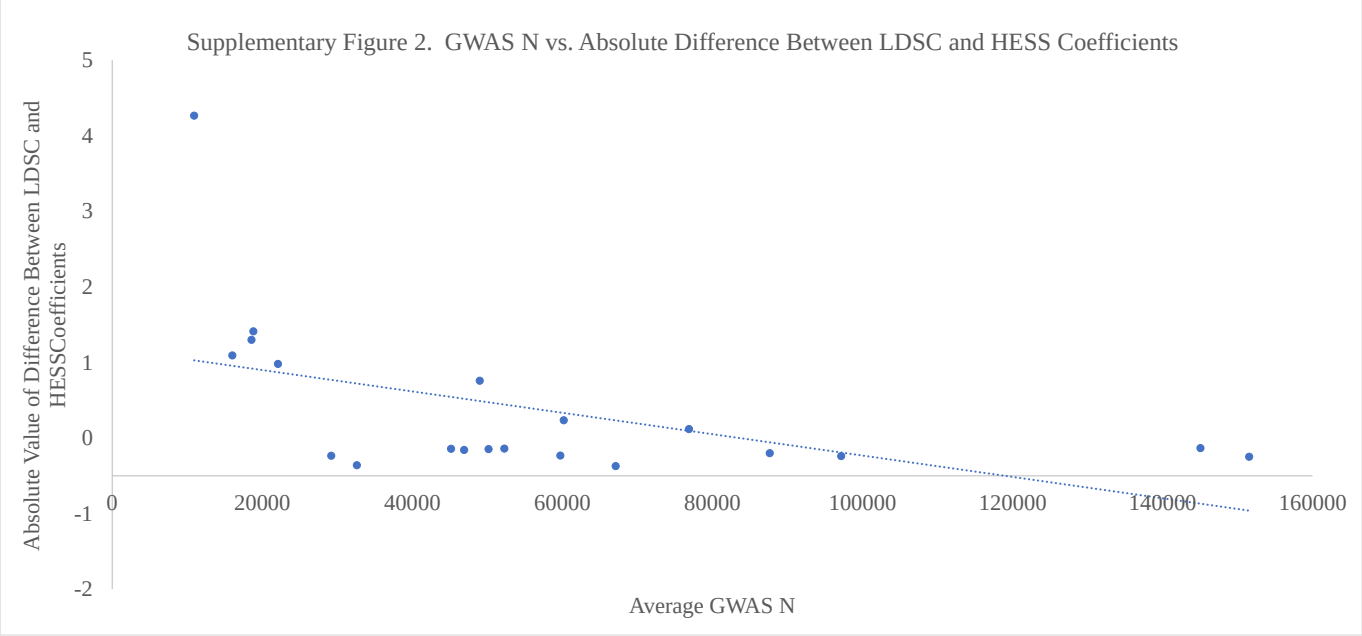
Estimated Error of Genetic Covariance	Phenotype 1 Estimated Heritability	Phenotype 1 Error of Heritability Estimate	Phenotype 1 Genomic Inflation Factor (Lambda GC)	Phenotype 2 Estimated Heritability	Phenotype 2 Error of Heritability Estimate	Phenotype 2 Genomic Inflation Factor (Lambda GC)
0.0143	0.1637	0.0484	1.0802	0.1496	0.0298	1.0466
0.0236	0.1601	0.0516	1.0833	0.1945	0.0414	1.1301
0.0098	0.1779	0.0481	1.0802	0.0842	0.0062	1.2697
0.0097	0.1779	0.0481	1.0802	0.0742	0.0111	1.1779
0.0174	0.1532	0.0485	1.0802	0.0797	0.0173	1.0496
0.0123	0.1779	0.0481	1.0802	0.0718	0.0062	1.1587
0.013	0.1539	0.0453	1.0802	0.1296	0.0253	1.105
0.0097	0.1779	0.0481	1.0802	0.0557	0.0089	1.1144
0.0297	0.1575	0.0476	1.0802	0.3655	0.0664	1.0557
0.0449	0.1545	0.0489	1.0802	0.8085	0.1345	1.0345
0.0283	0.1647	0.0472	1.0802	0.2484	0.0443	1.1747
0.0354	0.1698	0.0547	1.0772	0.31	0.0495	1.1175
0.0268	0.1595	0.048	1.0802	0.4885	0.0625	1.1491
0.0241	0.1595	0.048	1.0802	0.2453	0.0338	1.1333
0.0298	0.1425	0.0302	1.0466	0.1952	0.0417	1.1301
0.0053	0.1495	0.0298	1.0466	0.0839	0.0063	1.2697
0.0073	0.1495	0.0298	1.0466	0.0725	0.0112	1.1747
0.0093	0.1504	0.0298	1.0466	0.0774	0.0174	1.0496
0.0052	0.1495	0.0298	1.0466	0.0709	0.0064	1.1587
0.0075	0.146	0.0269	1.0466	0.1292	0.0256	1.105
0.0088	0.1495	0.0298	1.0466	0.0538	0.0088	1.1113
0.0192	0.1444	0.0305	1.0466	0.3522	0.0623	1.0557
0.0239	0.15	0.0293	1.0466	0.7983	0.1364	1.0345
0.0157	0.1498	0.0297	1.0466	0.2503	0.0448	1.1747
0.0158	0.138	0.0252	1.0466	0.3102	0.0495	1.1175
0.0156	0.1497	0.0298	1.0466	0.4809	0.0589	1.1491
0.0122	0.1497	0.0298	1.0466	0.2334	0.0345	1.1333
0.0094	0.1954	0.0415	1.1301	0.084	0.007	1.2731
0.0092	0.1954	0.0415	1.1301	0.075	0.0121	1.1779
0.0143	0.1965	0.0413	1.1301	0.073	0.0181	1.0481
0.008	0.1954	0.0415	1.1301	0.071	0.0066	1.1651
0.0137	0.1945	0.0414	1.1301	0.1364	0.0276	1.1113
0.0122	0.1954	0.0415	1.1301	0.053	0.0093	1.1144
0.034	0.2099	0.0402	1.1301	0.4082	0.0692	1.0557
0.0384	0.1973	0.0422	1.1301	0.7434	0.1372	1.0375
0.0294	0.1975	0.0415	1.1301	0.26	0.0477	1.1747
0.0245	0.2177	0.0415	1.1207	0.3073	0.0528	1.1207
0.025	0.1947	0.0414	1.1301	0.4908	0.0706	1.1523
0.0187	0.1947	0.0414	1.1301	0.2185	0.0357	1.1364
0.0063	0.0843	0.0062	1.2697	0.0742	0.0111	1.1779
0.0061	0.0847	0.0063	1.2697	0.0795	0.0174	1.0496

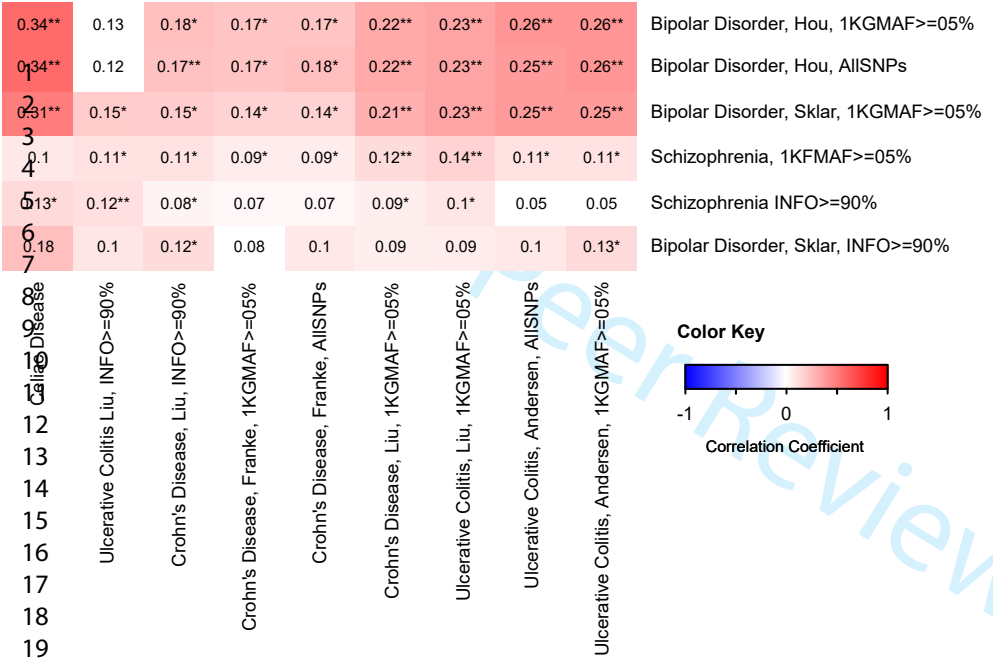
0.0037	0.0843	0.0062	1.2697	0.0718	0.0062	1.1587
0.0049	0.0848	0.0065	1.2664	0.1291	0.0255	1.105
0.0033	0.0843	0.0062	1.2697	0.0558	0.0089	1.1144
0.0122	0.0845	0.0062	1.2731	0.3655	0.0662	1.0557
0.0142	0.0846	0.0062	1.2697	0.8042	0.1344	1.0345
0.0088	0.084	0.0061	1.2697	0.2479	0.0445	1.1747
0.0115	0.0839	0.0067	1.2564	0.3103	0.0494	1.1175
0.0114	0.0839	0.0062	1.2664	0.4876	0.062	1.1491
0.0081	0.0839	0.0062	1.2664	0.2422	0.0343	1.1333
0.0062	0.0732	0.0112	1.1747	0.0795	0.0174	1.0496
0.0032	0.0742	0.0111	1.1779	0.0718	0.0062	1.1587
0.0051	0.0739	0.0105	1.1715	0.1291	0.0255	1.105
0.0039	0.0742	0.0111	1.1779	0.0557	0.0089	1.1144
0.0153	0.0717	0.0114	1.1811	0.3655	0.0662	1.0557
0.016	0.0736	0.0111	1.1747	0.8043	0.1344	1.0345
0.0107	0.073	0.0111	1.1747	0.2479	0.0445	1.1747
0.0122	0.0711	0.0124	1.1587	0.3103	0.0494	1.1175
0.0116	0.0732	0.0109	1.1747	0.4876	0.0621	1.1491
0.0102	0.0732	0.0109	1.1747	0.2422	0.0343	1.1333
0.0056	0.0795	0.0174	1.0496	0.0707	0.0064	1.1587
0.01	0.0762	0.0167	1.0496	0.1281	0.0257	1.105
0.0063	0.0795	0.0174	1.0496	0.0537	0.0089	1.1113
0.021	0.0804	0.0181	1.0527	0.3656	0.0669	1.0557
0.0277	0.0775	0.0172	1.0527	0.7872	0.1365	1.0345
0.0156	0.0787	0.0168	1.0527	0.2535	0.0443	1.1747
0.02	0.0622	0.0177	1.0527	0.3168	0.0503	1.1175
0.0171	0.0799	0.0174	1.0496	0.4858	0.0595	1.1523
0.0138	0.0799	0.0174	1.0496	0.2414	0.0345	1.1333
0.0049	0.0724	0.006	1.1587	0.1291	0.0255	1.105
0.0033	0.0718	0.0062	1.1587	0.0557	0.0089	1.1144
0.011	0.0698	0.0063	1.1619	0.3655	0.0662	1.0557
0.0158	0.0716	0.0063	1.1587	0.8043	0.1344	1.0345
0.0092	0.0703	0.0062	1.1587	0.2479	0.0445	1.1747
0.0115	0.0709	0.0071	1.1459	0.3103	0.0494	1.1175
0.01	0.0711	0.0063	1.1587	0.4876	0.0621	1.1491
0.0073	0.0712	0.0063	1.1587	0.2422	0.0343	1.1333
0.0056	0.1291	0.0255	1.105	0.0528	0.0086	1.1113
0.0196	0.1326	0.0283	1.1082	0.3565	0.0641	1.0527
0.0252	0.127	0.0246	1.105	0.7809	0.1304	1.0345
0.0192	0.128	0.0261	1.105	0.2487	0.0451	1.1715
0.0155	0.1322	0.0306	1.1019	0.31	0.0497	1.1175
0.0159	0.1297	0.0254	1.105	0.4801	0.0619	1.1491
0.0129	0.1296	0.0254	1.105	0.2345	0.0325	1.1333
0.0121	0.0538	0.0091	1.1144	0.3655	0.0662	1.0557
0.0154	0.0543	0.0088	1.1113	0.8043	0.1344	1.0345
0.0128	0.0532	0.0088	1.1113	0.2479	0.0445	1.1747
0.0115	0.0546	0.0094	1.1019	0.3103	0.0494	1.1175

0.0092	0.0538	0.0086	1.1113	0.4876	0.0621	1.1491
0.0082	0.0539	0.0086	1.1113	0.2422	0.0343	1.1333
0.054	0.3527	0.0646	1.0557	0.7836	0.1411	1.0375
0.0351	0.3628	0.0667	1.0557	0.2507	0.0448	1.1747
0.0358	0.272	0.0668	1.0466	0.3142	0.0495	1.1207
0.0334	0.3661	0.0667	1.0557	0.4886	0.0622	1.1523
0.0288	0.3661	0.0666	1.0557	0.2284	0.0366	1.1396
0.0386	0.7959	0.132	1.0345	0.2542	0.0442	1.1747
0.0485	0.7963	0.139	1.0345	0.3018	0.0504	1.1175
0.0458	0.8102	0.1337	1.0345	0.4869	0.0636	1.1523
0.0397	0.8102	0.1337	1.0345	0.2407	0.035	1.1333
0.0292	0.2364	0.0451	1.1587	0.3075	0.0521	1.1175
0.0242	0.2486	0.0443	1.1747	0.484	0.0626	1.1523
0.0212	0.2486	0.0443	1.1747	0.2398	0.0345	1.1333
0.0317	0.3105	0.0496	1.1175	0.4674	0.0626	1.1428
0.0294	0.3105	0.0496	1.1175	0.2242	0.0376	1.127
0.0303	0.4887	0.0626	1.1491	0.2453	0.0338	1.1333

Supplementary Figure 1. LDSC vs. HESS Regression Coefficient




Supplementary Figure 2. GWAS N vs. Absolute Difference Between LDSC and HESS Coefficients
Absolute Value of Difference Between LDSC and HESSCoefficients
5
4
3
2
1
0
-1
-2
0
20000
40000
60000
80000
100000
120000
140000
160000
Average GWAS N


0.34** 0.13 0.18* 0.17* 0.17* 0.22** 0.23** 0.26** 0.26** Bipolar Disorder, Hou, 1KGMAF>=05%
0.34** 0.12 0.17** 0.17* 0.18* 0.22** 0.23** 0.25** 0.26** Bipolar Disorder, Hou, AllSNPs
0.31** 0.15* 0.15* 0.14* 0.14* 0.21** 0.23** 0.25** 0.25** Bipolar Disorder, Sklar, 1KGMAF>=05%
0.1 0.11* 0.11* 0.09* 0.09* 0.12** 0.14** 0.11* 0.11* Schizophrenia, 1KFMAF>=05%
0.13* 0.12** 0.08* 0.07 0.07 0.09* 0.1* 0.05 0.05 Schizophrenia INFO>=90%
0.18 0.1 0.12* 0.08 0.1 0.09 0.09 0.1 0.13* Bipolar Disorder, Sklar, INFO>=90%
Celiac Disease
Ulcerative Colitis Liu, INFO>=90%
Crohn's Disease, Liu, INFO>=90%
Crohn's Disease, Franke, 1KGMAF>=05%
Crohn's Disease, Franke, AllSNPs
Crohn's Disease, Liu, 1KGMAF>=05%
Ulcerative Colitis, Liu, 1KGMAF>=05%
Ulcerative Colitis, Andersen, AllSNPs
Ulcerative Colitis, Andersen, 1KGMAF>=05%
Color Key
-1
0
1
Correlation Coefficient

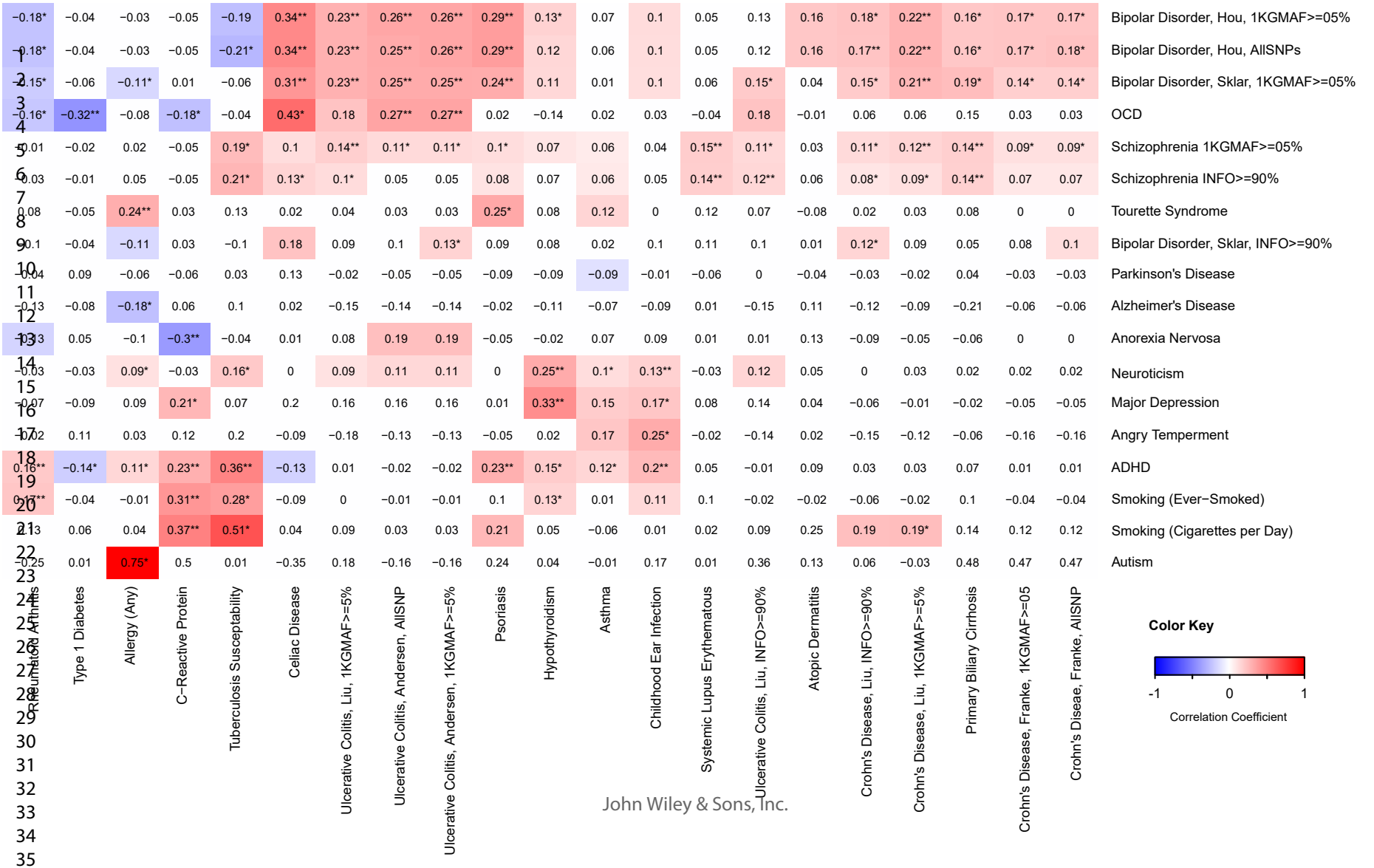


Figure 2